TOYOTOMI

Service Manual

MODEL: CCT 301 INV
CCT 501 INV
CCT 70 INV-S
CCT 100 INV-S
CCT 140 INV-S
CCT 170 INV-S

Four-way Cassette Type

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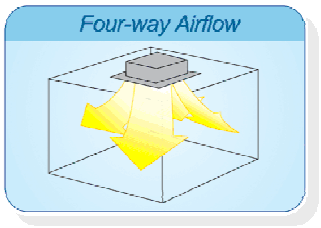
1. Features

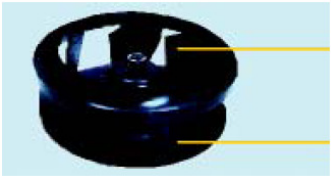
(1) Low operation noise
---Streamline plate ensures quietness
---Creates natural and comfortable environment

(2) Efficient cooling---Equal, fast and wide—range cooling



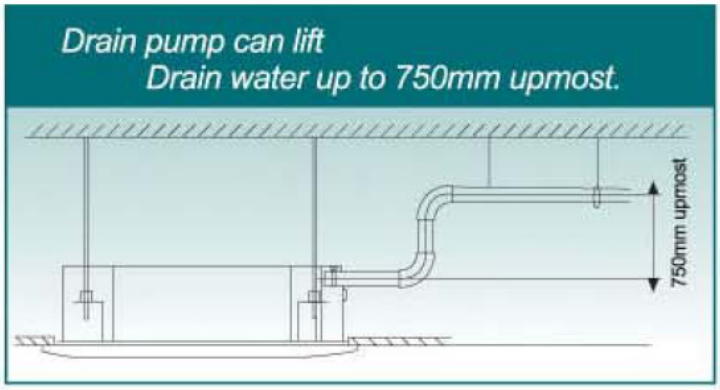
(3) Excellent performance. Fin spacing 1.5mm, higher heat-exchanging efficiency and lower noise. The optimal evaporator & sufficient airflow volume guarantees the excellent capacity

(4) The adoption of the most advanced 3- Dimensional Screw fan
—Reduces the air resistance passing through
—Smoothes the air flow
—Makes air speed distribution to the heat exchange uniform

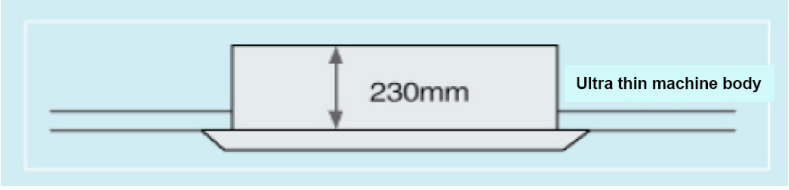


(5) Fresh air makes life healthier and more comfortable.

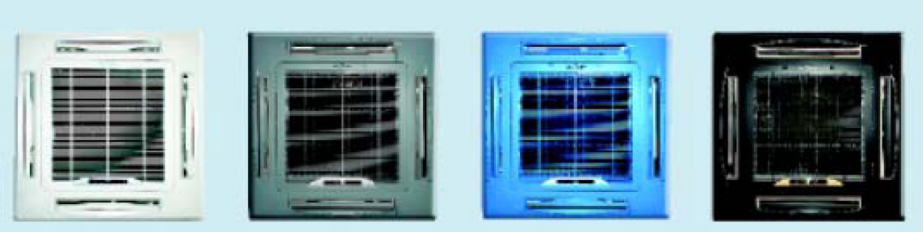
(6) Built-in water pump with 750mm pumping head.



(7) Ultra thin machine body to easy installation and maintenance. 18K~30K:230mm, 36~60K:300mm.



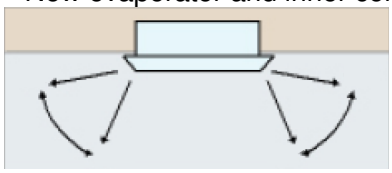
(8) Different color panels for choose: White、Gray、Blue、Black



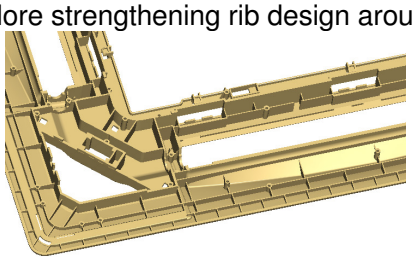
White Gray (optional) Blue (optional) Black (optional)

(9) Swing angle of louver

1) Add one more swing motor, one motor driving two louvers. Controlling the interspace of each part, minimizing the angle loss.
2) The swing angle of the first louver are 40~42 degrees and the second louver are 37~38 degrees. New evaporator and inner configuration designed can acquire high heat-exchanger effect.

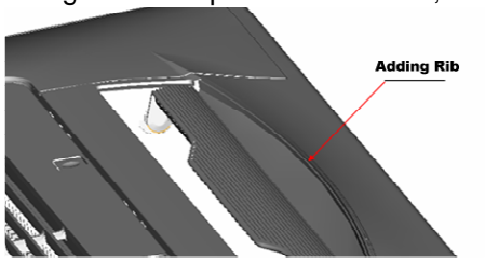


(10) More strengthening rib design around the panel, preventing the distortion for the panel.

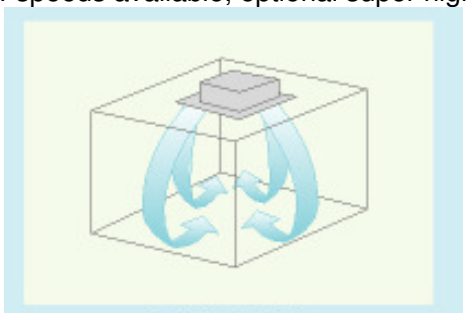


(11) New outlet frame design to make the phenomena of coagulation great improvement: prevent the condensing water from damaging the air guide strip.

(12) Adding rib on the panel of fan outlet, which can avoid the air outlet direct flow to people.

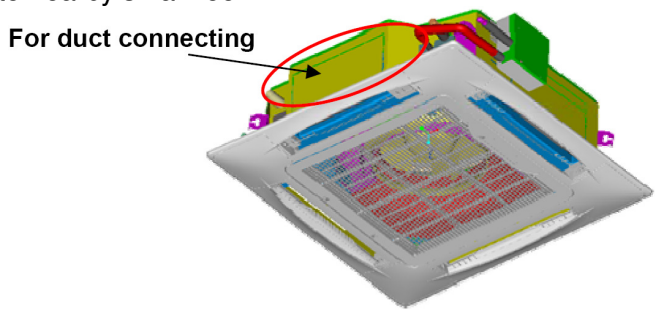


(13) 4 speeds available, optional super high fan speed design suitable for the large building over 3m high.

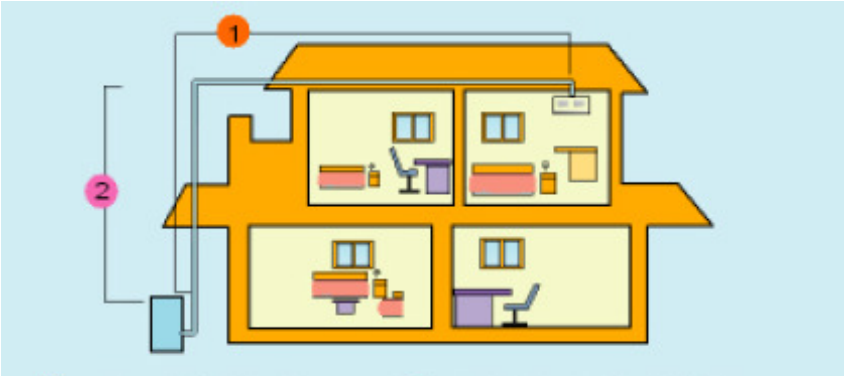


(14) Adding digital tube displaying on the display board. LED can display the Error Code to make the malfunction checking easier.

(15) Reserve spaces for air side-outlet, it is available to connect duct pipe hence Air supplying from the four sides to nearby small room..

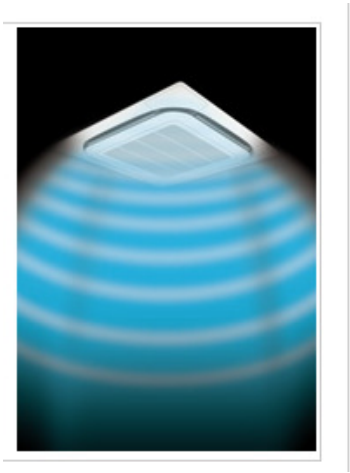


(16) The connecting pipe and drop height is higher. Max. pipe length up to 50m（refer to ①）, and Max. drop height up to 30m（refer to ②）.



(17) Optimal design, smaller Control Box, Space saving and convenient for wiring,
Using fire resistance galvanized steel for E-box material. Metal box make the control part more stable and prevent damaging.

(18) 360° air flow panel : 360° air flow delivery ensures uniform airflow distribution. 60K is standard, the others are optional.



2. Specifications

Model	Indoor	Model name	**CCT 50 INV-Si**	**CCT 70 INV-Si**
		Code	220042400370	220042500500
		Power supply	220~240V-1 Ph-50Hz	220~240V-1 Ph-50Hz
	Outdoor	Model name	**CCT 50 INV-So**	**CCT 70 INV-So**
		Code	220075200340	220075301070
		Power supply	220~240V-1 Ph-50Hz	220~240V-1 Ph-50Hz
Cooling	Capacity(Max.-Rated-Min.)	KW	5.65-5.28-1.59	7.85-7.03-1.59
	Input(Max.-Rated-Min.)	KW	2.6-1.62-0.56	2.8-2.13-0.98
	Current(Max.-Rated-Min.)	A	12.3-7.04-2.43	13.2-9.78-4.26
	EER		3.26	3.3
Heating	Capacity(Max.-Rated-Min.)	KW	7.05-6.15-1.45	8.5-8.2-1.70
	Input(Max.-Rated-Min.)	KW	2.34-1.65-0.72	2.60-2.18-1.05
	Current(Max.-Rated-Min.)	A	11.07-6.91-3.13	12.23-9.13-4.56
	COP		3.73	3.75
Max. input consumption		W	2400	3250
Max. current		A	13.1	15.48
Compressor	Model		C-6RVN93H0V	ATL165SD-C9AU
	Type		Rotary DC Inverter	Rotary DC Inverter
	Brand		Shenyang SANYO	HITACHI
	Capacity	Btu/h	19277.8	15525
	Input	W	1470	1530
	Rated current(RLA)	A	8.96	10.4
	Thermal protector		-	-
	Capacitor	uF	-	-
	Refrigerant oil	ml	FV 50S, 350	68HES-H,880
Indoor fan motor	Model		YDK60-6F	YDK80-6E
	Type		AC MOTOR	AC MOTOR
	Input	w	85/75/70	110/100/90
	Capacitor	uF	3uF/450V	3.5uF/450V
	Speed(hi/mi/lo)	r/min	550/480/410	670/550/400
Indoor coil	a.Number of rows		2	2
	b.Tube pitch(a)x row pitch(b)	mm	21 x13.37	21 x13.37
	c.Fin spacing	mm	1.5	1.5
	d.Fin type (code)		Hydrophilic aluminum	Hydrophilic aluminum
	e.Tube outside dia.and type	mm	Φ7 Inner groove tube	Φ7 Inner groove tube
	f.Coil length x height x width	mm	1990x168x26.74	1990x168x26.74
	g.Number of circuits		8	8
Indoor air flow (Hi/Mi/Lo)		m^3/h	940/790/655	1220/1010/820
Sound level (sound pressure)		dB(A)	40/38.5/37	42/40.5/39
Indoor unit	Dimension (W x H x D)	mm	840x230x840	840x230x840
	Packing (W x H x D)	mm	955x247x955	955x247x955
	Net/Gross weight	kg	28/34	29/36
Panel	Dimension (W x H x D)	mm	950 x55x950	950 x55x950
	Packing (W x H x D)	mm	1035x90x1035	1035x90x1035
	Net/Gross weight	kg	6/9	6/9

Outdoor fan motor	Model		YDK53-6Y	YDK53-6Z
	Type		AC MOTOR	AC MOTOR
	Input	W	129/86	141.5/92
	Capacitor	uF	3uF/450V	3uF/450V
	Speed	r/min	770/560	815/550
Outdoor coil	Number of rows		2	2
	Tube pitch(a)x row pitch(b)	mm	22×19.05	25.4/22
	Fin spacing	mm	1.4	1.5
	Fin type (code)		Hydrophilic aluminium	Hydrophilic aluminum
	Tube outside dia.and type	mm	7.94 innergroove tube	9.53 inner groove tube
	Coil length x height x width	mm	778×660×38.1	758x813x44
	Number of circuits		2	2
Outdoor air flow(Hi/Low)		m^3/h	2570/2300	3200/2850
Sound level(sound pressure)(Hi/Low)		dB(A)	51/46	53/48
Outdoor unit	Dimension(WxDxH)	mm	842×695×324	895x862x313
	Packing (WxDxH)	mm	965x752x399	1043x915x395
	Net/Gross weight	kg	59/63	73/76
Refrigerant	Type		R410A	R410A
	Charged volume	g	1600	2300
Throttle type			Electronic expansion valve & Capillary	Electronic expansion valve & Capillary
Design pressure(Hi/Low)		MPa	4.2/2.0	4.2/2.0
Refrigerant piping	Liquid side/ Gas side	mm	6.4/12.7	Φ9.5/Φ15.9
	Max. refrigerant pipe length	m	25	25
	Max. difference in level(Outdoor is up)	m	12	12
	Max. difference in level (Outdoor is down)	m	9	9
Connection wiring	Power wiring (Indoor)	mm^2	3 core×1.0	3 core×1.0
	Power wiring (Outdoor)	mm^2	3 core x 2.5	3 core x 2.5
	Signal wiring	mm^2	3-core shielded wire x0.5	3-core shielded wire x0.5
Drainage water pipe dia.		mm	Φ32	Φ32
Wireless remote controller			R05/BGE (standard)	R05/BGE (standard)
Operation temp		℃	17～30	17～30
Ambient temp		℃	Cooling：-15~43(*) Heating：-15~24	Cooling：-15~43(*) Heating：-15~24

(*) Optional Low Ambient Kit included. Cooling Operation Range without it: 7 to 43°C

Model	Indoor	Model name	**CCT 90 INV-Si**	**CCT 100 INV-Si**
		Code	220042600010	220042700390
		Power supply	220~240V-1 Ph-50Hz	220~240V-1 Ph-50Hz
	Outdoor	Model name	**CCT 90 INV-So**	**CCT 100 INV-Si-1**
		Code	220075401041	220075500651
		Power supply	220~240V-1 Ph-50Hz	220~240V-1 Ph-50Hz
Cooling	Capacity(Max.-Rated-Min.)	KW	10.5-8.792-2.4	12.4-10.55-2.9
	Input(Max.-Rated-Min.)	KW	4.6-2.71-1.1	5.5-3.28-2.3
	Current(Max.-Rated-Min.)	A	23-11.78-4.78	25-14.13-10
	EER		3.24	3.22
Heating	Capacity(Max.-Rated-Min.)	KW	12.0-9.965-2.75	13.2-11.025-3.7
	Input(Max.-Rated-Min.)	KW	3.37-2.74-1.3	3.94-3.03-2.0
	Current(Max.-Rated-Min.)	A	16.8-11.9-5.65	17.9-13.17-8.69
	COP		3.64	3.63
Max. input consumption		W	4600	5500
Max. current		A	23	25
Compressor	Model		TNB220FLBM1	TNB306FPGM
	Type		Rotor DC Inverter	Rotor DC Inverter
	Brand		MITSUBISHI ELECTRIC	MITSUBISHI ELECTRIC
	Capacity	Btu/h	24328	33642
	Input	W	2200	3080
	Rated current(RLA)	A	9.7	13.5
	Thermal protector		-	-
	Capacitor	uF	-	-
	Refrigerant oil	ml	MEL 56, 670	FV50S, 870
Indoor fan motor	Model		YDK90-6E	YDK90-6E
	Type		AC MOTOR	AC MOTOR
	Input	w	143/116/100	143/116/100
	Capacitor	uF	3.5uF/450V	3.5uF/450V
	Speed(hi/mi/lo)	r/min	770/640/550	770/640/550
Indoor coil	a.Number of rows		2	2
	b.Tube pitch(a)x row pitch(b)	mm	21 x13.37	21x13.37
	c.Fin spacing	mm	1.5	1.5
	d.Fin type (code)		Hydrophilic aluminum	Hydrophilic aluminum
	e.Tube outside dia.and type	mm	Φ7 Inner groove tube	Φ7 Inner groove tube
	f.Coil length x height x width	mm	1990x252x26.74	1990x252x26.74
	g.Number of circuits		12	12
Indoor air flow (Hi/Mi/Lo)		m^3/h	1530/1300/1120	1530/1300/1120
Sound level (sound pressure)		dB(A)	44/42.5/41	44/42.5/41
Indoor unit	Dimension (W x H x D)	mm	840x300x840	840x300x840
	Packing (W x H x D)	mm	955x317x955	955x317x955
	Net/Gross weight	kg	36/41	36/41
Panel	Dimension (W x H x D)	mm	950 x55x950	950 x55x950
	Packing (W x H x D)	mm	1035x90x1035	1035x90x1035
	Net/Gross weight	kg	6/9	6/9

Outdoor fan motor	Model		YDK250-6E	(YDK100-6A)×2
	Type		AC MOTOR	AC MOTOR
	Input	W	307/194	(185/120)×2
	Capacitor	uF	10uF±5% 450V	(3.5uF/450V)×2
	Speed	r/min	740/530	(860/610)×2
Outdoor coil	Number of rows		2	2.5
	Tube pitch(a)x row pitch(b)	mm	25.4×22	25.4×22
	Fin spacing	mm	1.7	1.5
	Fin type (code)		Hydrophilic aluminum	Hydrophilic aluminum
	Tube outside dia.and type	mm	Φ9.53 innergroove tube	Φ9.53 innergroove tube
	Coil length x height x width	mm	876x914.4x44	887×1220×44
	Number of circuits		4	8
Outdoor air flow(Hi/Low)		m^3/h	5000/4800	6000/5800
Sound level(sound pressure)(Hi/Low)		dB(A)	55/50	57/52
Outdoor unit	Dimension(WxDxH)	mm	990×966×354	940×1245×360
	Packing (WxDxH)	mm	1120×1100×435	1058×1380×438
	Net/Gross weight	kg	92/100	106/114
Refrigerant	Type		R410A	R410A
	Charged volume	g	3350	4100
Throttle type			Electronic expansion valve & Capillary	Electronic expansion valve & Capillary
Design pressure(Hi/Low)		MPa	4.2/2.0	4.2/2.0
Refrigerant piping	Liquid side/ Gas side	mm	Φ9.5/Φ15.9	Φ9.5/Φ15.9
	Max. refrigerant pipe length	m	25	30
	Max. difference in level(Outdoor is up)	m	15	20
	Max. difference in level (Outdoor is down)	m	9	12
Connection wiring	Power wiring (Indoor)	mm^2	3 core×1.0	3 core×1.0
	Power wiring (Outdoor)	mm^2	3 core x 2.5	3 core x 2.5
	Signal wiring	mm^2	3-core shielded wire x0.5	3-core shielded wire x0.5
Drainage water pipe dia.		mm	Φ32	Φ32
Wireless remote controller			R05/BGE (standard)	R05/BGE (standard)
Operation temp		℃	17～30	17～30
Ambient temp		℃	Cooling：-15~43(*) Heating：-15~24	Cooling：-15~43(*) Heating：-15~24

(*) Optional Low Ambient Kit included. Cooling Operation Range without it: 7 to 43°C

Model	Indoor	Model name	**CCT 100 INV-Si**	**CCT 140 INV-Si**
		Code	220042700390	220042800480
		Power supply	220~240V-1 Ph-50Hz	220~240V-1 Ph-50Hz
	Outdoor	Model name	**CCT 100 INV-So**	**CCT 140 INV-So-1**
		Code	220075500920	220075700540
		Power supply	380V~3 Ph-50Hz	220~240V-1 Ph-50Hz
Cooling	Capacity(Max.-Rated-Min.)	KW	12.4-10.55-2.9	15.0-14.068-3.4
	Input(Max.-Rated-Min.)	KW	5.5-3.27-2.3	6.0-4.36-2.5
	Current(Max.-Rated-Min.)	A	8.46-4.71-3.30	28-18.96-10.8
	EER		3.23	3.23
Heating	Capacity(Max.-Rated-Min.)	KW	13.2-11.72-3.7	16.0-15.24-4.2
	Input(Max.-Rated-Min.)	KW	3.94-3.2-2.0	5.6-4.16-2.3
	Current(Max.-Rated-Min.)	A	6.03-4.67-2.89	26.1-18.09-10
	COP		3.66	3.66
Max. input consumption		W	5000	6000
Max. current		A	7.5	28
Compressor	Model		TNB306FPNM	TNB306FPGM
	Type		Rotary DC Inverter	Rotor DC Inverter
	Brand		MITSUBISHI ELECTRIC	MITSUBISHI ELECTRIC
	Capacity	Btu/h	33710	33642
	Input	W	3010	3080
	Rated current(RLA)	A	9.3	13.5
	Thermal protector		-	-
	Capacitor	uF	-	-
	Refrigerant oil	ml	FV50S, 870	FV50S, 870
Indoor fan motor	Model		YDK90-6E	YDK90-6E
	Type		AC MOTOR	AC MOTOR
	Input	w	143/116/100	143/116/100
	Capacitor	uF	3.5uF/450V	3.5uF/450V
	Speed(hi/mi/lo)	r/min	770/640/550	770/640/550
Indoor coil	a.Number of rows		2	2
	b.Tube pitch(a)x row pitch(b)	mm	21x13.37	21x13.37
	c.Fin spacing	mm	1.5	1.5
	d.Fin type (code)		Hydrophilic aluminum	Hydrophilic aluminum
	e.Tube outside dia.and type	mm	Φ7 Inner groove tube	Φ7 Inner groove tube
	f.Coil length x height x width	mm	1990x252x26.74	1990x252x26.74
	g.Number of circuits		12	12
Indoor air flow (Hi/Mi/Lo)		m^3/h	1530/1300/1120	1530/1300/1120
Sound level (sound pressure)		dB(A)	44/42.5/41	44/42.5/41
Indoor unit	Dimension (W x H x D)	mm	840x300x840	840x300x840
	Packing (W x H x D)	mm	955x317x955	955x317x955
	Net/Gross weight	kg	36/41	36/41
Panel	Dimension (W x H x D)	mm	950 x55x950	950 x55x950
	Packing (W x H x D)	mm	1035x90x1035	1035x90x1035
	Net/Gross weight	kg	6/9	6/9
Outdoor fan	Model		YDK250-6E(×1)	(YDK100-6A)×2

motor	Type		AC Motor	AC MOTOR
	Input	W	307/194	(185/120)×2
	Capacitor	uF	10uF±5% 450V	(3.5uF/450V)×2
	Speed	r/min	740/530	(860/610)×2
Outdoor coil	Number of rows		2	2
	Tube pitch(a)x row pitch(b)	mm	25.4×22	25.4×22
	Fin spacing	mm	1.7	1.5
	Fin type (code)		Hydrophilic aluminum	Hydrophilic aluminum
	Tube outside dia.and type	mm	Φ9.53 Inner grooved copper tube	Φ9.53 innergroove tube
	Coil length x height x width	mm	876×914.4×44	887×1220×44
	Number of circuits		4	8
Outdoor air flow(Hi/Low)		m^3/h	5000/4800	6000/5800
Sound level(sound pressure)(Hi/Low)		dB(A)	55/50	59/54
Outdoor unit	Dimension(WxDxH)	mm	990×966×354	940×1245×360
	Packing (WxDxH)	mm	1120×1100×435	1058×1380×438
	Net/Gross weight	kg	87/95	106/114
Refrigerant	Type		R410A	R410A
	Charged volume	g	2900	4450
Throttle type			Electronic expansion valve & Capillary	Electronic expansion valve & Capillary
Design pressure(Hi/Low)		MPa	4.2/2.0	4.2/2.0
Refrigerant piping	Liquid side/ Gas side	mm	Φ9.5/Φ15.9	Φ9.5/Φ15.9
	Max. refrigerant pipe length	m	30	50
	Max. difference in level(Outdoor is up)	m	20	25
	Max. difference in level (Outdoor is down)	m	12	20
Connection wiring	Power wiring (Indoor)	mm^2	3×1.0	3 core×1.0
	Power wiring (Outdoor)	mm^2	5×2.5	3 core x 2.5
	Signal wiring	mm^2	3-core shield wire 3×0.5	3-core shielded wire x0.5
Drainage water pipe dia.		mm	Φ32	Φ32
Wireless remote controller			R05/BGE (standard)	R05/BGE (standard)
Operation temp		℃	17～30	17～30
Ambient temp		℃	Cooling：-15~43(*) Heating：-15~24	Cooling：-15~43(*) Heating：-15~24

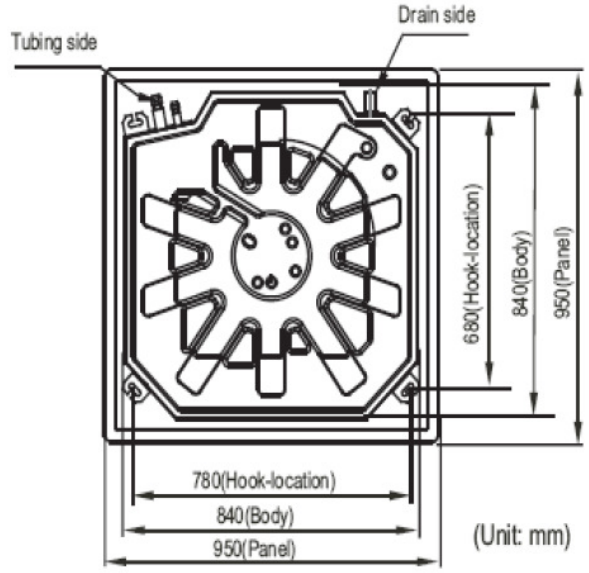
(*) Optional Low Ambient Kit included. Cooling Operation Range without it: 7 to 43°C

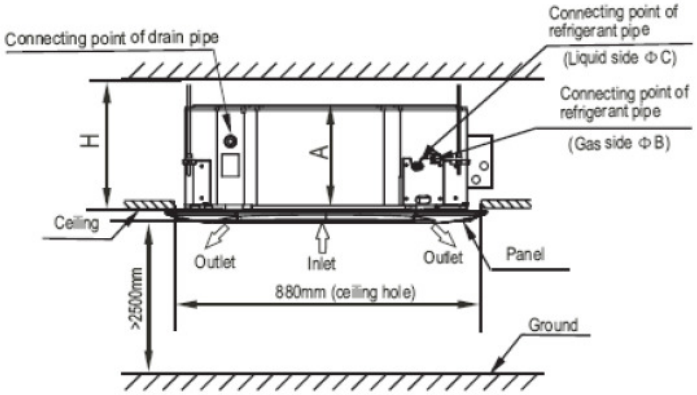
Model	Indoor	Model name	**CCT 140 INV-Si**	**CCT 170 INV-Si**
		Code	220042800480	220042900010
		Power supply	220~240V-1 Ph-50Hz	220~240V-1 Ph-50Hz
	Outdoor	Model name	**CCT 140 INV-So**	**CCT 170 INV-So**
		Code	220075700690	220075801220
		Power supply	380V~3 Ph-50Hz	380~415V-3 Ph-50Hz
Cooling	Capacity(Max.-Rated-Min.)	KW	15-14.07-3.4	17.96-17.58-4.21
	Input(Max.-Rated-Min.)	KW	5.95-4.29-2.5	7.6-5.84-3.1
	Current(Max.-Rated-Min.)	A	8.5-6.30-3.6	10.8-7.43-4.43
	EER		3.28	3.01
Heating	Capacity(Max.-Rated-Min.)	KW	16-15.53-4.2	20.48-20.22-4.8
	Input(Max.-Rated-Min.)	KW	5.58-4.14-2.3	6.98-5.68-2.7
	Current(Max.-Rated-Min.)	A	7.96-6.22-3.30	9.8-7.01-3.85
	COP		3.61	3.56
Max. input consumption		W	5500	7200
Max. current		A	7.8	10.2
Compressor	Model		TNB306FPNM	ANB42FBEMT
	Type		Rotary DC Inverter	Scroll DC Inverter
	Brand		MITSUBISHI ELECTRIC	SIAM
	Capacity	Btu/h	33710	47440
	Input	W	3010	4160
	Rated current(RLA)	A	9.3	15.2
	Thermal protector		-	—
	Capacitor	uF	-	—
	Refrigerant oil	ml	FV50S, 870	MEL 56, 1700
Indoor fan motor	Model		YDK90-6E	YDK90-6E-1
	Type		AC MOTOR	AC MOTOR
	Input	w	143/116/100	143/116/100
	Capacitor	uF	3.5uF/450V	4uF/450V
	Speed(hi/mi/lo)	r/min	770/640/550	770/640/550
Indoor coil	a.Number of rows		2	3
	b.Tube pitch(a)x row pitch(b)	mm	21x13.37	21×13.37
	c.Fin spacing	mm	1.5	1.5
	d.Fin type (code)		Hydrophilic aluminum	Hydrophilic aluminum
	e.Tube outside dia.and type	mm	Φ7 Inner groove tube	Φ7 Inner grooved copper tube
	f.Coil length x height x width	mm	1990x252x26.74	2080×252×40.11
	g.Number of circuits		12	12
Indoor air flow (Hi/Mi/Lo)		m^3/h	1530/1300/1120	1800/1480/1280
Sound level (sound pressure)		dB(A)	44/42.5/41	46/44/42
Indoor unit	Dimension (W x H x D)	mm	840x300x840	840×300×840
	Packing (W x H x D)	mm	955x317x955	955×317×955
	Net/Gross weight	kg	36/41	42/50
Panel	Dimension (W x H x D)	mm	950 x55x950	950 x55x950
	Packing (W x H x D)	mm	1035x90x1035	1035×90×1035
	Net/Gross weight	kg	6/9	6/9

Outdoor fan motor	Model		YDK100-6A(×2)	(YDK100-6A)×2
	Type		AC Motor	AC MOTOR
	Input	W	185/120	185/120
	Capacitor	uF	3.5uF/450V	3.5uF/450V
	Speed	r/min	860/610	860/610
Outdoor coil	Number of rows		2	3
	Tube pitch(a)x row pitch(b)	mm	25.4×22	25.4× 22
	Fin spacing	mm	1.8	1.5
	Fin type (code)		Hydrophilic aluminum	Hydrophilic aluminum
	Tube outside dia.and type	mm	Φ9.53 Inner grooved copper tube	Φ9.53 inner grooved copper tube
	Coil length x height x width	mm	887×1220×44	887×1220×66
	Number of circuits		8	8
Outdoor air flow(Hi/Low)		m^3/h	6000/5800	6000/5800
Sound level(sound pressure)(Hi/Low)		dB(A)	59/54	59/54
Outdoor unit	Dimension(WxDxH)	mm	940×1245×360	940×1245×360
	Packing (WxDxH)	mm	1058×1380×438	1058×1380×438
	Net/Gross weight	kg	99/107	124/130
Refrigerant	Type		R410A	R410A
	Charged volume	g	3600	4000
Throttle type			Electronic expansion valve & Capillary	Electronic expansion valve & Capillary
Design pressure(Hi/Low)		MPa	4.2/2.0	4.2/2.0
Refrigerant piping	Liquid side/ Gas side	mm	9.5/15.9	Φ9.5/Φ15.9
	Max. refrigerant pipe length	m	50	50
	Max. difference in level(Outdoor is up)	m	30	30
	Max. difference in level (Outdoor is down)	m	20	20
Connection wiring	Power wiring (Indoor)	mm^2	3×1.0	3 core×1.0
	Power wiring (Outdoor)	mm^2	5×2.5	5 core×2.5
	Signal wiring	mm^2	3-core shield wire 3×0.5	3-core shielded wire x0.5
Drainage water pipe dia.		mm	Φ32	Φ32
Wireless remote controller			R05/BGE (standard)	R05/BGE (standard)
Operation temp		℃	17～30	17～30
Ambient temp		℃	Cooling：-15~43(*) Heating：-15~24	Cooling:-15~43(*) Heating:-15~24

(*) Optional Low Ambient Kit included. Cooling Operation Range without it: 7 to 43°C

3. Dimensions



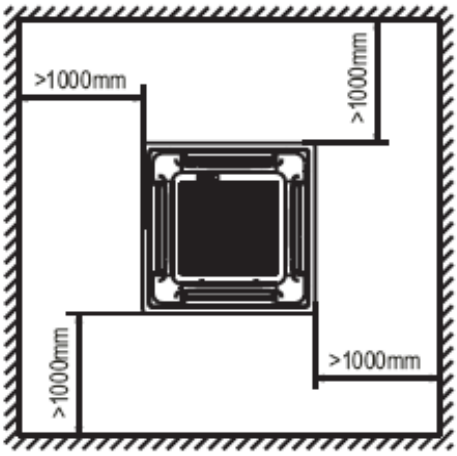


Unit: mm

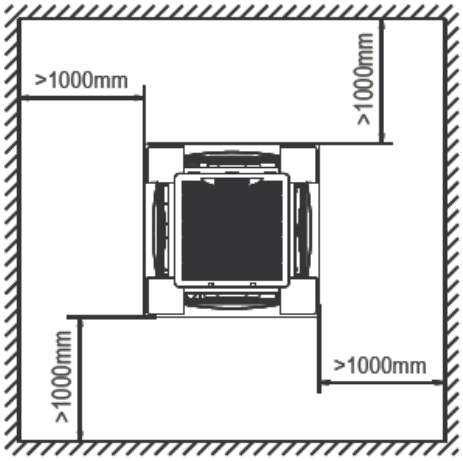
MODEL(Btu/h)	A	B	C	H
18000	230	Φ12.7	Φ6.4	>260
24000	230	Φ15.9	Φ9.5	>260
30000	300	Φ15.9	Φ9.5	>330
36000	300	Φ15.9	Φ9.5	>330
48000	300	Φ15.9	Φ9.5	>330
60000	300	Φ15.9	Φ9.5	>330

4. Service Space

For 18-48k

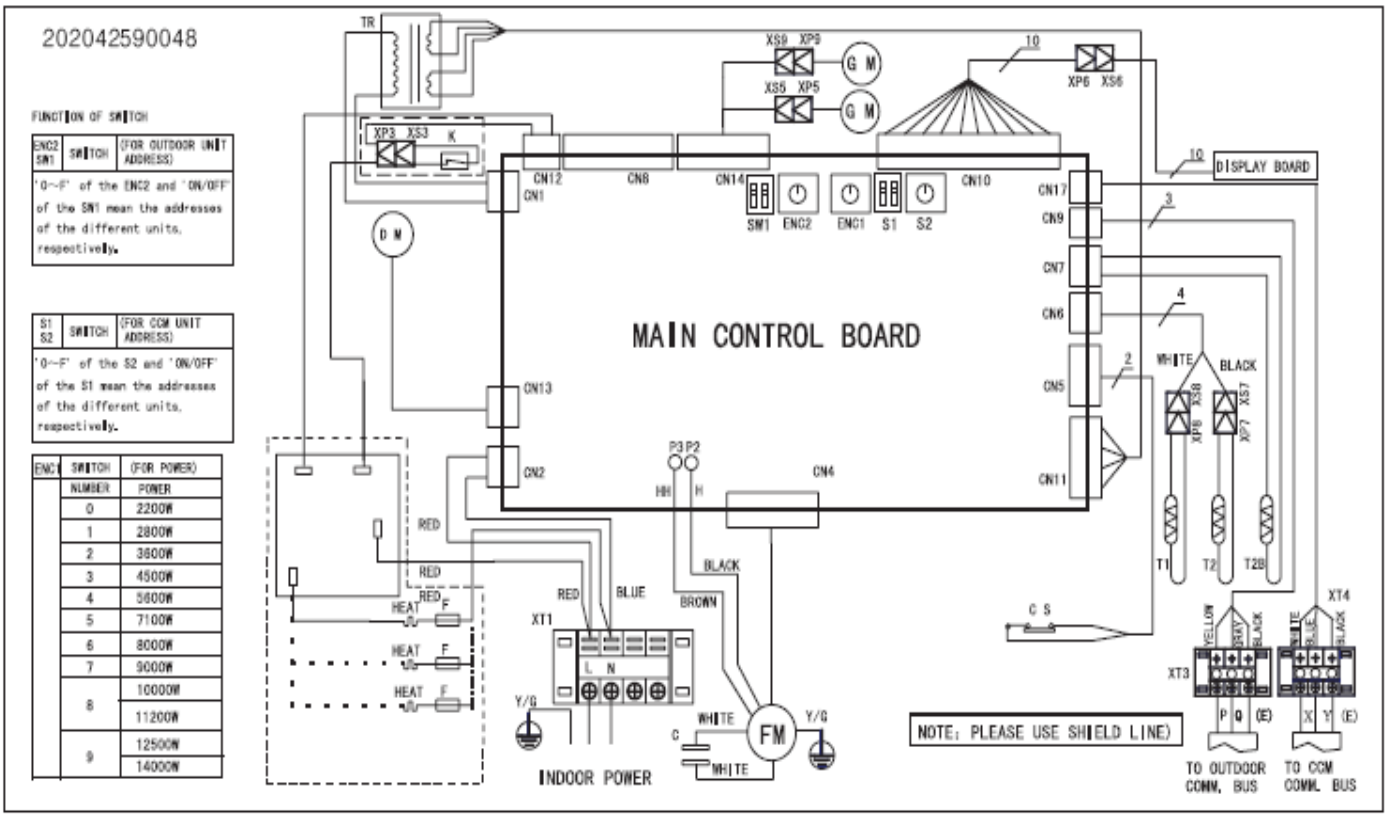


For 60k

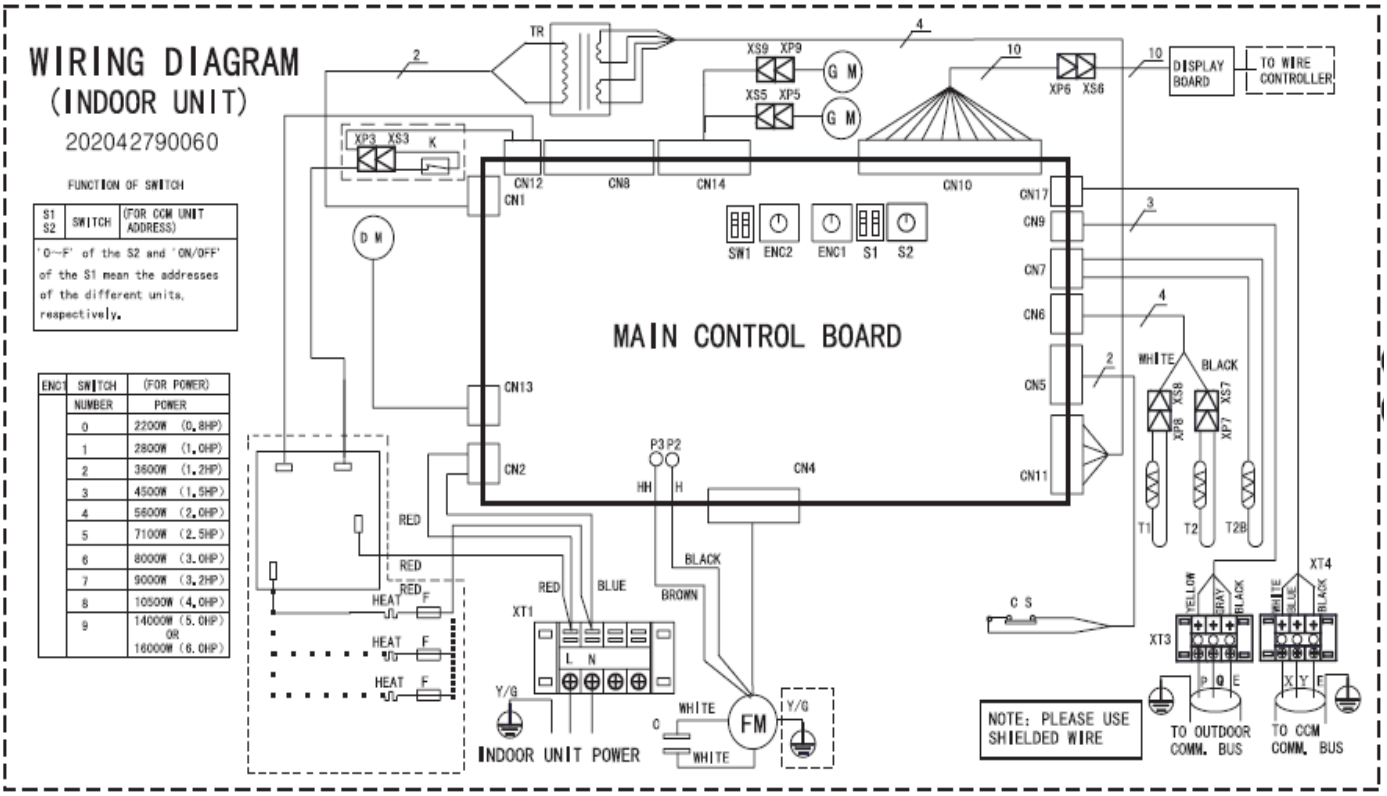


5. Wiring Diagrams

CCT 50 INV-Si、CCT 70 INV-Si

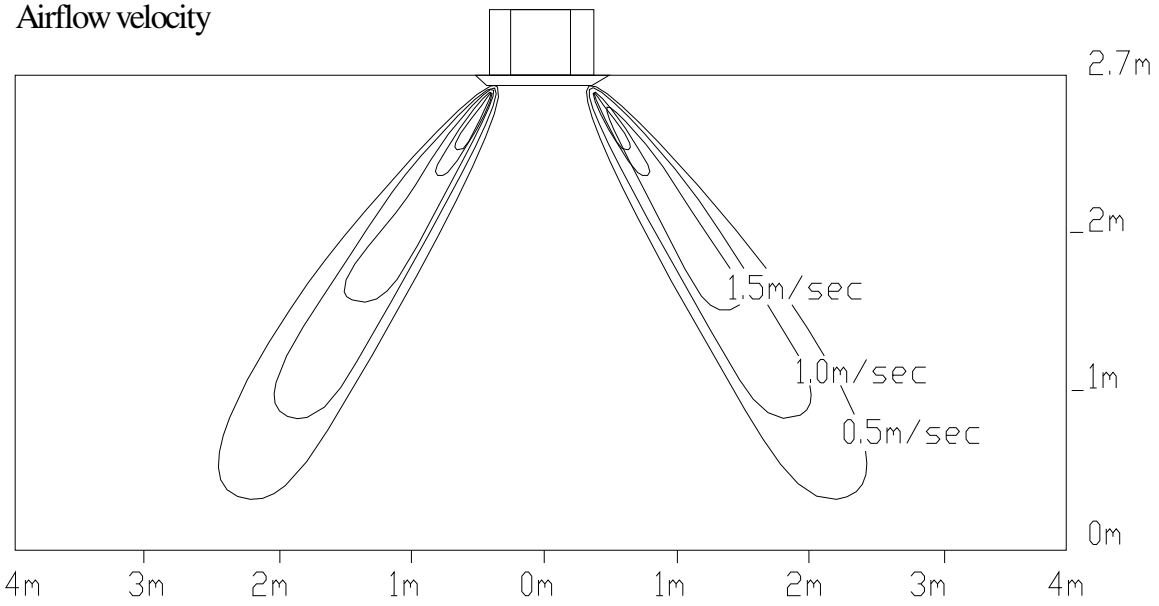


CCT 90 INV-Si、CCT100 INV-Si、CCT 140 INV-Si、CCT 170 INV-Si、

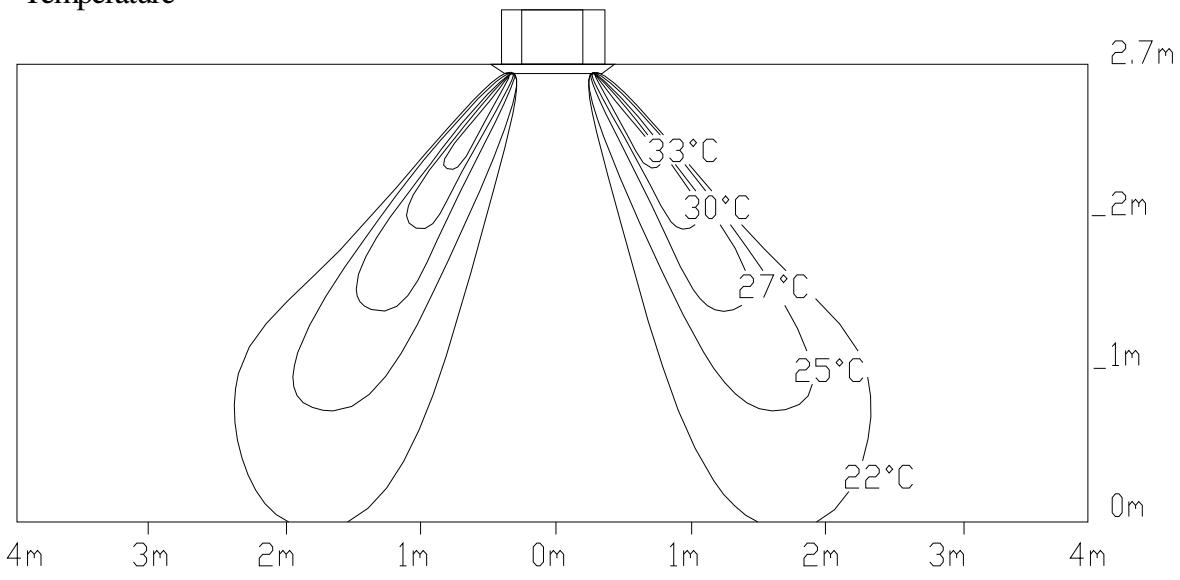


6. Air Velocity and Temperature Distributions

Airflow velocity



Temperature



7. Capacity Tables

CCT 50 INV-Si

Cooling

Outdoor temperature(℃ DB)	Indoor temperature(℃ WB)													
	14.00		16.00		18.00		19.00		20.00		22.00		24.00	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
10.00	3.65	0.54	4.31	0.67	4.97	0.81	5.28	0.87	5.57	0.94	5.69	0.95	5.82	0.96
12.00	3.65	0.55	4.31	0.69	4.97	0.82	5.28	0.89	5.57	0.96	5.69	0.96	5.82	0.97
14.00	3.65	0.56	4.31	0.70	4.97	0.84	5.28	0.91	5.57	0.98	5.69	0.98	5.82	0.99
16.00	3.65	0.57	4.31	0.71	4.97	0.85	5.28	0.92	5.57	1.00	5.69	1.00	5.82	1.01
18.00	3.65	0.58	4.31	0.72	4.97	0.87	5.28	0.94	5.57	1.01	5.69	1.02	5.82	1.03
19.00	3.65	0.59	4.31	0.74	4.97	0.88	5.28	0.96	5.57	1.03	5.69	1.03	5.82	1.04
21.00	3.65	0.63	4.31	0.79	4.97	0.94	5.28	1.02	5.57	1.10	5.69	1.11	5.82	1.12
23.00	3.65	0.68	4.31	0.85	4.97	1.01	5.28	1.10	5.57	1.18	5.69	1.19	5.82	1.20
25.00	3.65	0.73	4.31	0.90	4.97	1.08	5.28	1.17	5.57	1.27	5.69	1.27	5.82	1.28
27.00	3.65	0.78	4.31	0.97	4.97	1.16	5.28	1.26	5.57	1.35	5.69	1.36	5.82	1.37
29.00	3.65	0.83	4.31	1.03	4.97	1.24	5.28	1.34	5.57	1.45	5.69	1.45	5.82	1.46
31.00	3.65	0.88	4.31	1.10	4.97	1.32	5.28	1.43	5.57	1.54	5.69	1.55	5.82	1.56
33.00	3.65	0.94	4.31	1.17	4.97	1.40	5.28	1.52	5.57	1.64	5.69	1.65	5.82	1.66
35.00	3.65	1.00	4.31	1.25	4.97	1.49	5.28	1.62	5.57	1.75	5.69	1.75	5.82	1.77
37.00	3.65	1.06	4.31	1.33	4.97	1.59	5.28	1.72	5.57	1.86	5.69	1.86	5.82	1.88
39.00	3.65	1.07	4.31	1.33	4.97	1.60	5.28	1.73	5.57	1.87	5.69	1.87	5.82	1.89
41.00	3.65	1.07	4.31	1.34	4.97	1.60	5.28	1.74	5.57	1.87	5.69	1.88	5.82	1.90
43.00	3.65	1.08	4.31	1.34	4.97	1.61	5.28	1.75	5.57	1.88	5.69	1.89	5.82	1.91

Heating

Outdoor air temp.		Indoor temperature(℃ DB)											
		16		18		20		21		22		24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
℃ DB	℃ WB	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
-14.7	-15	3.72	1.30	3.72	1.33	3.72	1.36	3.57	1.30	3.43	1.24	3.13	1.12
-12.6	-13	3.93	1.32	3.93	1.35	3.93	1.38	3.77	1.32	3.62	1.26	3.30	1.14
-10.5	-11	4.13	1.35	4.13	1.37	4.13	1.40	3.97	1.34	3.81	1.28	3.48	1.16
-9.5	-10	4.23	1.36	4.23	1.38	4.23	1.41	4.07	1.35	3.90	1.29	3.56	1.17
-8.5	-9.1	4.33	1.37	4.33	1.40	4.33	1.42	4.16	1.36	3.99	1.30	3.64	1.17
-7	-7.6	4.48	1.38	4.48	1.41	4.48	1.44	4.30	1.38	4.12	1.31	3.77	1.19
-5	-5.6	4.68	1.40	4.68	1.43	4.68	1.46	4.49	1.40	4.31	1.33	3.93	1.21
-3	-3.7	4.87	1.42	4.87	1.45	4.87	1.48	4.68	1.42	4.49	1.35	4.10	1.22
0	-0.7	5.17	1.45	5.17	1.48	5.17	1.52	4.96	1.45	4.76	1.38	4.35	1.25
3	2.2	5.47	1.48	5.47	1.52	5.47	1.55	5.25	1.48	5.03	1.41	4.60	1.28
5	4.1	5.86	1.50	5.86	1.54	5.86	1.61	5.54	1.50	5.31	1.43	4.76	1.29
7	6	6.15	1.52	6.15	1.60	6.15	1.70	5.93	1.52	5.59	1.45	4.93	1.31
9	7.9	6.15	1.47	6.15	1.51	6.15	1.59	5.93	1.47	5.59	1.40	4.93	1.27
11	9.8	6.15	1.42	6.15	1.45	6.15	1.52	5.93	1.42	5.59	1.35	4.93	1.22
13	11.8	6.15	1.37	6.15	1.40	6.15	1.43	5.93	1.37	5.59	1.30	4.93	1.18
15	13.7	6.15	1.32	6.15	1.35	6.15	1.38	5.93	1.32	5.59	1.26	4.93	1.14

CCT 70 INV-Si

Cooling

Outdoor temperature(℃ DB)	Indoor temperature(℃ WB)													
	14.00		16.00		18.00		19.00		20.00		22.00		24.00	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
10.00	4.87	0.73	5.75	0.91	6.63	1.09	7.03	1.18	7.44	1.27	7.60	1.27	7.76	1.29
12.00	4.87	0.74	5.75	0.92	6.63	1.11	7.03	1.20	7.44	1.29	7.60	1.30	7.76	1.31
14.00	4.87	0.75	5.75	0.94	6.63	1.13	7.03	1.22	7.44	1.32	7.60	1.32	7.76	1.33
16.00	4.87	0.77	5.75	0.96	6.63	1.15	7.03	1.24	7.44	1.34	7.60	1.34	7.76	1.36
18.00	4.87	0.78	5.75	0.97	6.63	1.17	7.03	1.26	7.44	1.36	7.60	1.37	7.76	1.38
19.00	4.87	0.79	5.75	0.99	6.63	1.19	7.03	1.29	7.44	1.39	7.60	1.39	7.76	1.40
21.00	4.87	0.85	5.75	1.06	6.63	1.27	7.03	1.38	7.44	1.49	7.60	1.49	7.76	1.51
23.00	4.87	0.91	5.75	1.14	6.63	1.36	7.03	1.48	7.44	1.59	7.60	1.60	7.76	1.61
25.00	4.87	0.98	5.75	1.22	6.63	1.46	7.03	1.58	7.44	1.70	7.60	1.71	7.76	1.73
27.00	4.87	1.04	5.75	1.30	6.63	1.56	7.03	1.69	7.44	1.82	7.60	1.83	7.76	1.84
29.00	4.87	1.11	5.75	1.39	6.63	1.66	7.03	1.80	7.44	1.94	7.60	1.95	7.76	1.97
31.00	4.87	1.19	5.75	1.48	6.63	1.77	7.03	1.92	7.44	2.07	7.60	2.08	7.76	2.10
33.00	4.87	1.27	5.75	1.58	6.63	1.89	7.03	2.05	7.44	2.21	7.60	2.22	7.76	2.24
35.00	4.87	1.35	5.75	1.68	6.63	2.01	7.03	2.13	7.44	2.35	7.60	2.36	7.76	2.38
37.00	4.87	1.43	5.75	1.79	6.63	2.14	7.03	2.32	7.44	2.50	7.60	2.51	7.76	2.53
39.00	4.87	1.44	5.75	1.79	6.63	2.15	7.03	2.33	7.44	2.51	7.60	2.52	7.76	2.54
41.00	4.87	1.45	5.75	1.80	6.63	2.16	7.03	2.34	7.44	2.52	7.60	2.53	7.76	2.55
43.00	4.87	1.45	5.75	1.81	6.63	2.17	7.03	2.35	7.44	2.53	7.60	2.54	7.76	2.57

Heating

Outdoor air temp.		Indoor temperature(℃ DB)											
		16		18		20		21		22		24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
℃ DB	℃ WB	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
-14.7	-15	4.93	1.72	4.93	1.76	4.93	1.79	4.73	1.72	4.54	1.64	4.15	1.48
-12.6	-13	5.20	1.75	5.20	1.79	5.20	1.82	5.00	1.74	4.79	1.66	4.38	1.50
-10.5	-11	5.48	1.78	5.48	1.82	5.48	1.85	5.26	1.77	5.04	1.69	4.61	1.53
-9.5	-10	5.61	1.79	5.61	1.83	5.61	1.87	5.39	1.79	5.16	1.70	4.72	1.54
-8.5	-9.1	5.74	1.80	5.74	1.84	5.74	1.88	5.51	1.80	5.28	1.72	4.83	1.55
-7	-7.6	5.94	1.82	5.94	1.86	5.94	1.90	5.70	1.82	5.46	1.74	4.99	1.57
-5	-5.6	6.20	1.85	6.20	1.89	6.20	1.93	5.95	1.85	5.71	1.76	5.21	1.59
-3	-3.7	6.46	1.88	6.46	1.92	6.46	1.96	6.20	1.87	5.95	1.79	5.43	1.62
0	-0.7	6.85	1.92	6.85	1.96	6.85	2.00	6.58	1.91	6.31	1.83	5.76	1.65
3	2.2	7.24	1.96	7.24	2.00	7.24	2.04	6.96	1.95	6.67	1.86	6.09	1.69
5	4.1	7.50	1.99	7.50	2.03	7.50	2.07	7.21	1.98	6.91	1.89	6.31	1.71
7	6	8.2	2.01	8.2	2.06	8.2	2.19	7.46	2.01	7.15	1.92	6.53	1.73
9	7.9	8.2	1.95	8.2	1.99	8.2	2.09	7.46	1.94	7.15	1.85	6.53	1.67
11	9.8	8.2	1.88	8.2	1.92	8.2	1.96	7.46	1.87	7.15	1.79	6.53	1.62
13	11.8	8.2	1.81	8.2	1.85	8.2	1.89	7.46	1.81	7.15	1.72	6.53	1.56
15	13.7	8.2	1.74	8.2	1.78	8.2	1.82	7.46	1.74	7.15	1.66	6.53	1.50

CCT 90 INV-Si

Cooling

Outdoor temperature(℃ DB)	Indoor temperature(℃ WB)													
	14.00		16.00		18.00		19.00		20.00		22.00		24.00	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
10.00	6.09	0.90	7.19	1.13	8.29	1.35	8.79	1.46	9.30	1.58	9.50	1.58	9.70	1.60
12.00	6.09	0.92	7.19	1.15	8.29	1.37	8.79	1.49	9.30	1.61	9.50	1.61	9.70	1.63
14.00	6.09	0.94	7.19	1.17	8.29	1.40	8.79	1.52	9.30	1.64	9.50	1.64	9.70	1.66
16.00	6.09	0.95	7.19	1.19	8.29	1.42	8.79	1.54	9.30	1.67	9.50	1.67	9.70	1.69
18.00	6.09	0.97	7.19	1.21	8.29	1.45	8.79	1.57	9.30	1.69	9.50	1.70	9.70	1.72
19.00	6.09	0.99	7.19	1.23	8.29	1.47	8.79	1.60	9.30	1.72	9.50	1.73	9.70	1.75
21.00	6.09	1.06	7.19	1.32	8.29	1.58	8.79	1.71	9.30	1.85	9.50	1.85	9.70	1.87
23.00	6.09	1.13	7.19	1.41	8.29	1.69	8.79	1.84	9.30	1.98	9.50	1.99	9.70	2.00
25.00	6.09	1.21	7.19	1.51	8.29	1.81	8.79	1.96	9.30	2.12	9.50	2.12	9.70	2.15
27.00	6.09	1.30	7.19	1.62	8.29	1.94	8.79	2.10	9.30	2.26	9.50	2.27	9.70	2.29
29.00	6.09	1.39	7.19	1.73	8.29	2.07	8.79	2.24	9.30	2.42	9.50	2.42	9.70	2.45
31.00	6.09	1.48	7.19	1.84	8.29	2.21	8.79	2.39	9.30	2.58	9.50	2.59	9.70	2.61
33.00	6.09	1.57	7.19	1.96	8.29	2.35	8.79	2.55	9.30	2.75	9.50	2.75	9.70	2.78
35.00	6.09	1.67	7.19	2.09	8.29	2.50	8.79	2.71	9.30	2.92	9.50	2.93	9.70	2.96
37.00	6.09	1.78	7.19	2.22	8.29	2.66	8.79	2.88	9.30	3.11	9.50	3.12	9.70	3.15
39.00	6.09	1.79	7.19	2.23	8.29	2.67	8.79	2.89	9.30	3.12	9.50	3.13	9.70	3.16
41.00	6.09	1.80	7.19	2.24	8.29	2.68	8.79	2.91	9.30	3.13	9.50	3.14	9.70	3.17
43.00	6.09	1.81	7.19	2.25	8.29	2.69	8.79	2.92	9.30	3.15	9.50	3.16	9.70	3.19

Heating

Outdoor air temp.		Indoor temperature(℃ DB)											
		16		18		20		21		22		24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
℃ DB	℃ WB	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
-14.7	-15	6.33	2.24	6.33	2.29	6.33	2.34	6.08	2.24	5.82	2.14	5.32	1.93
-12.6	-13	6.68	2.28	6.68	2.33	6.68	2.38	6.41	2.27	6.15	2.17	5.62	1.96
-10.5	-11	7.03	2.32	7.03	2.37	7.03	2.42	6.75	2.31	6.47	2.21	5.92	1.99
-9.5	-10	7.20	2.34	7.20	2.39	7.20	2.44	6.91	2.33	6.63	2.22	6.06	2.01
-8.5	-9.1	7.37	2.35	7.37	2.40	7.37	2.45	7.07	2.35	6.78	2.24	6.20	2.02
-7	-7.6	7.62	2.38	7.62	2.43	7.62	2.48	7.32	2.37	7.01	2.26	6.41	2.05
-5	-5.6	7.95	2.42	7.95	2.47	7.95	2.52	7.64	2.41	7.32	2.30	6.69	2.08
-3	-3.7	8.29	2.45	8.29	2.50	8.29	2.56	7.96	2.44	7.63	2.33	6.97	2.11
0	-0.7	8.79	2.50	8.79	2.56	8.79	2.61	8.44	2.50	8.09	2.38	7.40	2.15
3	2.2	9.29	2.56	9.29	2.61	9.29	2.67	8.93	2.55	8.56	2.43	7.82	2.20
5	4.1	9.63	2.59	9.63	2.65	9.63	2.70	9.25	2.58	8.87	2.47	8.10	2.23
7	6	9.97	2.63	9.97	2.68	9.97	2.74	9.57	2.62	9.17	2.50	8.38	2.26
9	7.9	9.97	2.54	9.97	2.59	9.97	2.65	9.57	2.53	9.17	2.42	8.38	2.18
11	9.8	9.97	2.45	9.97	2.50	9.97	2.56	9.57	2.44	9.17	2.33	8.38	2.11
13	11.8	9.97	2.36	9.97	2.41	9.97	2.46	9.57	2.36	9.17	2.25	8.38	2.03
15	13.7	9.97	2.27	9.97	2.32	9.97	2.37	9.57	2.27	9.17	2.16	8.38	1.96

CCT 100 INV-Si (1 Phase)

Cooling

Outdoor temperature(℃ DB)	Indoor temperature(℃ WB)													
	14.00		16.00		18.00		19.00		20.00		22.00		24.00	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
10.00	7.27	1.08	8.58	1.35	9.90	1.62	10.50	1.76	11.10	1.89	11.35	1.90	11.59	1.92
12.00	7.27	1.10	8.58	1.38	9.90	1.65	10.50	1.79	11.10	1.93	11.35	1.93	11.59	1.95
14.00	7.27	1.12	8.58	1.40	9.90	1.68	10.50	1.82	11.10	1.96	11.35	1.97	11.59	1.99
16.00	7.27	1.14	8.58	1.43	9.90	1.71	10.50	1.85	11.10	2.00	11.35	2.00	11.59	2.02
18.00	7.27	1.16	8.58	1.45	9.90	1.74	10.50	1.89	11.10	2.03	11.35	2.04	11.59	2.06
19.00	7.27	1.19	8.58	1.48	9.90	1.77	10.50	1.92	11.10	2.07	11.35	2.07	11.59	2.09
21.00	7.27	1.27	8.58	1.58	9.90	1.90	10.50	2.06	11.10	2.22	11.35	2.22	11.59	2.24
23.00	7.27	1.36	8.58	1.70	9.90	2.03	10.50	2.20	11.10	2.37	11.35	2.38	11.59	2.40
25.00	7.27	1.46	8.58	1.81	9.90	2.17	10.50	2.36	11.10	2.54	11.35	2.55	11.59	2.57
27.00	7.27	1.56	8.58	1.94	9.90	2.32	10.50	2.52	11.10	2.72	11.35	2.72	11.59	2.75
29.00	7.27	1.66	8.58	2.07	9.90	2.48	10.50	2.69	11.10	2.90	11.35	2.91	11.59	2.94
31.00	7.27	1.77	8.58	2.21	9.90	2.64	10.50	2.87	11.10	3.09	11.35	3.10	11.59	3.13
33.00	7.27	1.89	8.58	2.35	9.90	2.82	10.50	3.06	11.10	3.29	11.35	3.30	11.59	3.34
35.00	7.27	2.01	8.58	2.50	9.90	3.00	10.50	3.25	11.10	3.50	11.35	3.51	11.59	3.55
37.00	7.27	2.14	8.58	2.66	9.90	3.19	10.50	3.46	11.10	3.73	11.35	3.74	11.59	3.77
39.00	7.27	2.15	8.58	2.67	9.90	3.20	10.50	3.47	11.10	3.74	11.35	3.75	11.59	3.79
41.00	7.27	2.16	8.58	2.69	9.90	3.22	10.50	3.49	11.10	3.76	11.35	3.77	11.59	3.81
43.00	7.27	2.17	8.58	2.70	9.90	3.23	10.50	3.50	11.10	3.78	11.35	3.79	11.59	3.83

Heating

Outdoor air temp.		Indoor temperature(℃ DB)											
		16		18		20		21		22		24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
℃ DB	℃ WB	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
-14.7	-15	7.00	2.48	7.00	2.54	7.00	2.59	6.72	2.47	6.44	2.36	5.89	2.13
-12.6	-13	7.39	2.52	7.39	2.58	7.39	2.63	7.10	2.52	6.80	2.40	6.22	2.17
-10.5	-11	7.78	2.56	7.78	2.62	7.78	2.67	7.47	2.56	7.16	2.44	6.54	2.21
-9.5	-10	7.96	2.58	7.96	2.64	7.96	2.69	7.65	2.58	7.33	2.46	6.70	2.22
-8.5	-9.1	8.15	2.60	8.15	2.66	8.15	2.71	7.83	2.60	7.50	2.48	6.86	2.24
-7	-7.6	8.43	2.63	8.43	2.69	8.43	2.74	8.09	2.62	7.76	2.50	7.09	2.26
-5	-5.6	8.80	2.67	8.80	2.73	8.80	2.79	8.45	2.66	8.10	2.54	7.40	2.30
-3	-3.7	9.17	2.71	9.17	2.77	9.17	2.83	8.81	2.70	8.44	2.58	7.71	2.33
0	-0.7	9.73	2.77	9.73	2.83	9.73	2.89	9.34	2.76	8.95	2.63	8.18	2.38
3	2.2	10.28	2.83	10.28	2.89	10.28	2.95	9.88	2.82	9.47	2.69	8.65	2.43
5	4.1	10.65	2.87	10.65	2.93	10.65	2.99	10.23	2.86	9.81	2.73	8.96	2.47
7	6	11.03	2.91	11.03	2.97	11.03	3.03	10.59	2.90	10.15	2.76	9.28	2.50
9	7.9	11.03	2.81	11.03	2.87	11.03	2.93	10.59	2.80	10.15	2.67	9.28	2.42
11	9.8	11.03	2.71	11.03	2.77	11.03	2.83	10.59	2.70	10.15	2.58	9.28	2.33
13	11.8	11.03	2.61	11.03	2.67	11.03	2.72	10.59	2.61	10.15	2.49	9.28	2.25
15	13.7	11.03	2.52	11.03	2.57	11.03	2.62	10.59	2.51	10.15	2.39	9.28	2.16

CCT 100 INV-Si (3 Phase)
Cooling

Outdoor temperature(℃ DB)	Indoor temperature(℃ WB)													
	14.00		16.00		18.00		19.00		20.00		22.00		24.00	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
10.00	7.27	1.08	8.58	1.35	9.90	1.62	10.55	1.76	11.10	1.89	11.35	1.90	11.59	1.92
12.00	7.27	1.10	8.58	1.38	9.90	1.65	10.55	1.79	11.10	1.93	11.35	1.93	11.59	1.95
14.00	7.27	1.12	8.58	1.40	9.90	1.68	10.55	1.82	11.10	1.96	11.35	1.97	11.59	1.99
16.00	7.27	1.14	8.58	1.43	9.90	1.71	10.55	1.85	11.10	2.00	11.35	2.00	11.59	2.02
18.00	7.27	1.16	8.58	1.45	9.90	1.74	10.55	1.89	11.10	2.03	11.35	2.04	11.59	2.06
19.00	7.27	1.19	8.58	1.48	9.90	1.77	10.55	1.92	11.10	2.07	11.35	2.07	11.59	2.09
21.00	7.27	1.27	8.58	1.58	9.90	1.90	10.55	2.06	11.10	2.22	11.35	2.22	11.59	2.24
23.00	7.27	1.36	8.58	1.70	9.90	2.03	10.55	2.20	11.10	2.37	11.35	2.38	11.59	2.40
25.00	7.27	1.46	8.58	1.81	9.90	2.17	10.55	2.36	11.10	2.54	11.35	2.55	11.59	2.57
27.00	7.27	1.56	8.58	1.94	9.90	2.32	10.55	2.52	11.10	2.72	11.35	2.72	11.59	2.75
29.00	7.27	1.66	8.58	2.07	9.90	2.48	10.55	2.69	11.10	2.90	11.35	2.91	11.59	2.94
31.00	7.27	1.77	8.58	2.21	9.90	2.64	10.55	2.87	11.10	3.09	11.35	3.10	11.59	3.13
33.00	7.27	1.89	8.58	2.35	9.90	2.82	10.55	3.06	11.10	3.29	11.35	3.30	11.59	3.34
35.00	7.27	2.01	8.58	2.50	9.90	3.00	10.55	3.25	11.10	3.50	11.35	3.51	11.59	3.55
37.00	7.27	2.14	8.58	2.66	9.90	3.19	10.55	3.46	11.10	3.73	11.35	3.74	11.59	3.77
39.00	7.27	2.15	8.58	2.67	9.90	3.20	10.55	3.47	11.10	3.74	11.35	3.75	11.59	3.79
41.00	7.27	2.16	8.58	2.69	9.90	3.22	10.55	3.49	11.10	3.76	11.35	3.77	11.59	3.81
43.00	7.27	2.17	8.58	2.70	9.90	3.23	10.55	3.50	11.10	3.78	11.35	3.79	11.59	3.83

Heating

Outdoor air temp.		Indoor temperature(℃ DB)											
		16		18		20		21		22		24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
℃ DB	℃ WB	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
-14.7	-15	7.00	2.48	7.00	2.54	7.00	2.59	6.72	2.47	6.44	2.36	5.89	2.13
-12.6	-13	7.39	2.52	7.39	2.58	7.39	2.63	7.10	2.52	6.80	2.40	6.22	2.17
-10.5	-11	7.78	2.56	7.78	2.62	7.78	2.67	7.47	2.56	7.16	2.44	6.54	2.21
-9.5	-10	7.96	2.58	7.96	2.64	7.96	2.69	7.65	2.58	7.33	2.46	6.70	2.22
-8.5	-9.1	8.15	2.60	8.15	2.66	8.15	2.71	7.83	2.60	7.50	2.48	6.86	2.24
-7	-7.6	8.43	2.63	8.43	2.69	8.43	2.74	8.09	2.62	7.76	2.50	7.09	2.26
-5	-5.6	8.80	2.67	8.80	2.73	8.80	2.79	8.45	2.66	8.10	2.54	7.40	2.30
-3	-3.7	9.17	2.71	9.17	2.77	9.17	2.83	8.81	2.70	8.44	2.58	7.71	2.33
0	-0.7	9.73	2.77	9.73	2.83	9.73	2.89	9.34	2.76	8.95	2.63	8.18	2.38
3	2.2	10.28	2.83	10.28	2.89	10.28	2.95	9.88	2.82	9.47	2.69	8.65	2.43
5	4.1	10.95	2.87	10.95	2.93	10.95	2.99	10.23	2.86	9.81	2.73	8.96	2.47
7	6	11.72	2.91	11.72	2.97	11.72	3.20	10.59	2.90	10.15	2.76	9.28	2.50
9	7.9	11.72	2.81	11.72	2.87	11.72	2.98	10.59	2.80	10.15	2.67	9.28	2.42
11	9.8	11.72	2.71	11.72	2.77	11.72	2.83	10.59	2.70	10.15	2.58	9.28	2.33
13	11.8	11.72	2.61	11.72	2.67	11.72	2.72	10.59	2.61	10.15	2.49	9.28	2.25
15	13.7	11.72	2.52	11.72	2.57	11.72	2.62	10.59	2.51	10.15	2.39	9.28	2.16

CCT 140 INV-Si (1 Phase)
Cooling

Outdoor temperature(℃ DB)	Indoor temperature(℃ WB)													
	14.00		16.00		18.00		19.00		20.00		22.00		24.00	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
10.00	9.70	1.46	11.45	1.81	13.20	2.17	14.00	2.35	14.81	2.54	15.13	2.55	15.45	2.57
12.00	9.70	1.48	11.45	1.85	13.20	2.21	14.00	2.40	14.81	2.59	15.13	2.59	15.45	2.62
14.00	9.70	1.51	11.45	1.88	13.20	2.25	14.00	2.44	14.81	2.63	15.13	2.64	15.45	2.67
16.00	9.70	1.54	11.45	1.91	13.20	2.29	14.00	2.49	14.81	2.68	15.13	2.69	15.45	2.71
18.00	9.70	1.56	11.45	1.95	13.20	2.33	14.00	2.53	14.81	2.73	15.13	2.73	15.45	2.76
19.00	9.70	1.59	11.45	1.98	13.20	2.37	14.00	2.57	14.81	2.77	15.13	2.78	15.45	2.81
21.00	9.70	1.70	11.45	2.12	13.20	2.54	14.00	2.76	14.81	2.97	15.13	2.98	15.45	3.01
23.00	9.70	1.83	11.45	2.27	13.20	2.72	14.00	2.95	14.81	3.18	15.13	3.19	15.45	3.23
25.00	9.70	1.95	11.45	2.43	13.20	2.91	14.00	3.16	14.81	3.41	15.13	3.42	15.45	3.45
27.00	9.70	2.09	11.45	2.60	13.20	3.12	14.00	3.38	14.81	3.64	15.13	3.65	15.45	3.69
29.00	9.70	2.23	11.45	2.78	13.20	3.33	14.00	3.61	14.81	3.89	15.13	3.90	15.45	3.94
31.00	9.70	2.38	11.45	2.96	13.20	3.55	14.00	3.85	14.81	4.15	15.13	4.16	15.45	4.20
33.00	9.70	2.53	11.45	3.16	13.20	3.78	14.00	4.10	14.81	4.42	15.13	4.43	15.45	4.47
35.00	9.70	2.69	11.45	3.36	13.20	4.02	14.00	4.36	14.81	4.70	15.13	4.71	15.45	4.76
37.00	9.70	2.87	11.45	3.57	13.20	4.28	14.00	4.64	14.81	5.00	15.13	5.01	15.45	5.06
39.00	9.70	2.88	11.45	3.59	13.20	4.29	14.00	4.66	14.81	5.02	15.13	5.04	15.45	5.08
41.00	9.70	2.89	11.45	3.60	13.20	4.31	14.00	4.68	14.81	5.04	15.13	5.06	15.45	5.11
43.00	9.70	2.90	11.45	3.62	13.20	4.33	14.00	4.70	14.81	5.07	15.13	5.08	15.45	5.13

Heating

Outdoor air temp.		Indoor temperature(℃ DB)											
		16		18		20		21		22		24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
℃ DB	℃ WB	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
-14.7	-15	9.68	3.41	9.68	3.48	9.68	3.55	9.29	3.40	8.91	3.24	8.14	2.93
-12.6	-13	10.21	3.46	10.21	3.54	10.21	3.61	9.81	3.45	9.40	3.30	8.59	2.98
-10.5	-11	10.75	3.52	10.75	3.60	10.75	3.67	10.33	3.51	9.90	3.35	9.05	3.03
-9.5	-10	11.01	3.55	11.01	3.62	11.01	3.70	10.57	3.54	10.14	3.37	9.26	3.05
-8.5	-9.1	11.27	3.57	11.27	3.65	11.27	3.73	10.82	3.56	10.37	3.40	9.48	3.07
-7	-7.6	11.65	3.61	11.65	3.69	11.65	3.77	11.19	3.60	10.73	3.44	9.80	3.11
-5	-5.6	12.16	3.67	12.16	3.75	12.16	3.82	11.68	3.66	11.20	3.49	10.23	3.15
-3	-3.7	12.68	3.72	12.68	3.80	12.68	3.88	12.17	3.71	11.67	3.54	10.66	3.20
0	-0.7	13.45	3.80	13.45	3.88	13.45	3.96	12.91	3.79	12.38	3.62	11.31	3.27
3	2.2	14.21	3.88	14.21	3.97	14.21	4.05	13.65	3.87	13.09	3.69	11.96	3.34
5	4.1	14.73	3.94	14.73	4.02	14.73	4.10	14.14	3.92	13.56	3.74	12.39	3.38
7	6	15.24	3.99	15.24	4.07	15.24	4.16	14.64	3.98	14.03	3.80	12.82	3.43
9	7.9	15.24	3.86	15.24	3.94	15.24	4.02	14.64	3.84	14.03	3.67	12.82	3.32
11	9.8	15.24	3.72	15.24	3.80	15.24	3.88	14.64	3.71	14.03	3.54	12.82	3.20
13	11.8	15.24	3.59	15.24	3.66	15.24	3.74	14.64	3.58	14.03	3.41	12.82	3.09
15	13.7	15.24	3.45	15.24	3.53	15.24	3.60	14.64	3.44	14.03	3.29	12.82	2.97

CCT 140 INV-Si (3 Phase)
Cooling

Outdoor temperature(℃ DB)	Indoor temperature(℃ WB)													
	14.00		16.00		18.00		19.00		20.00		22.00		24.00	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
10.00	9.70	1.45	11.45	1.80	13.20	2.16	14.07	2.34	14.81	2.52	15.13	2.53	15.45	2.55
12.00	9.70	1.47	11.45	1.83	13.20	2.20	14.07	2.38	14.81	2.57	15.13	2.58	15.45	2.60
14.00	9.70	1.50	11.45	1.87	13.20	2.24	14.07	2.42	14.81	2.61	15.13	2.62	15.45	2.65
16.00	9.70	1.53	11.45	1.90	13.20	2.28	14.07	2.47	14.81	2.66	15.13	2.67	15.45	2.69
18.00	9.70	1.55	11.45	1.93	13.20	2.32	14.07	2.51	14.81	2.71	15.13	2.72	15.45	2.74
19.00	9.70	1.58	11.45	1.97	13.20	2.36	14.07	2.55	14.81	2.75	15.13	2.76	15.45	2.79
21.00	9.70	1.69	11.45	2.11	13.20	2.53	14.07	2.74	14.81	2.95	15.13	2.96	15.45	2.99
23.00	9.70	1.81	11.45	2.26	13.20	2.70	14.07	2.93	14.81	3.16	15.13	3.17	15.45	3.20
25.00	9.70	1.94	11.45	2.42	13.20	2.89	14.07	3.14	14.81	3.38	15.13	3.39	15.45	3.43
27.00	9.70	2.07	11.45	2.58	13.20	3.09	14.07	3.36	14.81	3.62	15.13	3.63	15.45	3.66
29.00	9.70	2.21	11.45	2.76	13.20	3.30	14.07	3.58	14.81	3.86	15.13	3.87	15.45	3.91
31.00	9.70	2.36	11.45	2.94	13.20	3.52	14.07	3.82	14.81	4.12	15.13	4.13	15.45	4.17
33.00	9.70	2.52	11.45	3.13	13.20	3.75	14.07	4.07	14.81	4.39	15.13	4.40	15.45	4.44
35.00	9.70	2.68	11.45	3.33	13.20	3.99	14.07	4.33	14.81	4.67	15.13	4.68	15.45	4.73
37.00	9.70	2.85	11.45	3.55	13.20	4.25	14.07	4.61	14.81	4.96	15.13	4.98	15.45	5.03
39.00	9.70	2.86	11.45	3.56	13.20	4.26	14.07	4.63	14.81	4.99	15.13	5.00	15.45	5.05
41.00	9.70	2.87	11.45	3.58	13.20	4.28	14.07	4.65	14.81	5.01	15.13	5.02	15.45	5.07
43.00	9.70	2.88	11.45	3.59	13.20	4.30	14.07	4.67	14.81	5.03	15.13	5.05	15.45	5.10

Heating

Outdoor air temp.		Indoor temperature(℃ DB)											
		16		18		20		21		22		24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
℃ DB	℃ WB	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
-14.7	-15	9.82	3.51	9.82	3.59	9.82	3.66	9.43	3.50	9.04	3.34	8.26	3.02
-12.6	-13	10.37	3.57	10.37	3.65	10.37	3.72	9.96	3.56	9.55	3.40	8.72	3.07
-10.5	-11	10.92	3.63	10.92	3.71	10.92	3.79	10.48	3.62	10.05	3.45	9.18	3.12
-9.5	-10	11.18	3.66	11.18	3.74	11.18	3.81	10.73	3.65	10.29	3.48	9.40	3.15
-8.5	-9.1	11.44	3.69	11.44	3.76	11.44	3.84	10.98	3.67	10.53	3.51	9.62	3.17
-7	-7.6	11.83	3.73	11.83	3.81	11.83	3.89	11.36	3.72	10.89	3.55	9.95	3.21
-5	-5.6	12.35	3.78	12.35	3.86	12.35	3.94	11.86	3.77	11.37	3.60	10.39	3.25
-3	-3.7	12.87	3.84	12.87	3.92	12.87	4.00	12.36	3.83	11.85	3.65	10.82	3.30
0	-0.7	13.65	3.92	13.65	4.00	13.65	4.09	13.11	3.91	12.56	3.73	11.48	3.37
3	2.2	14.43	4.00	14.43	4.09	14.43	4.12	13.86	3.99	13.28	3.81	12.14	3.44
5	4.1	14.95	4.06	14.95	4.14	14.95	4.18	14.36	4.05	13.76	3.86	12.58	3.49
7	6	15.53	4.11	15.53	4.13	15.53	4.14	14.86	4.10	14.24	3.91	13.01	3.54
9	7.9	15.53	3.98	15.53	4.06	15.53	4.12	14.86	3.96	14.24	3.78	13.01	3.42
11	9.8	15.53	3.84	15.53	3.92	15.53	4.00	14.86	3.83	14.24	3.65	13.01	3.30
13	11.8	15.53	3.70	15.53	3.78	15.53	3.86	14.86	3.69	14.24	3.52	13.01	3.18
15	13.7	15.53	3.56	15.53	3.64	15.53	3.71	14.86	3.55	14.24	3.39	13.01	3.06

CCT 170 INV-Si
Cooling

Outdoor temperature(℃ DB)	Indoor temperature(℃ WB)													
	14.00		16.00		18.00		19.00		20.00		22.00		24.00	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
10.00	12.17	1.51	14.37	1.88	16.57	2.25	17.58	2.44	18.59	2.63	19.00	2.64	19.40	2.67
12.00	12.17	1.60	14.37	2.00	16.57	2.39	17.58	2.60	18.59	2.80	19.00	2.81	19.40	2.84
14.00	12.17	1.71	14.37	2.13	16.57	2.55	17.58	2.76	18.59	2.98	19.00	2.99	19.40	3.02
16.00	12.17	1.82	14.37	2.27	16.57	2.71	17.58	2.94	18.59	3.17	19.00	3.18	19.40	3.21
18.00	12.17	1.93	14.37	2.41	16.57	2.88	17.58	3.13	18.59	3.37	19.00	3.38	19.40	3.42
19.00	12.17	2.05	14.37	2.56	16.57	3.07	17.58	3.33	18.59	3.59	19.00	3.60	19.40	3.63
21.00	12.17	2.19	14.37	2.73	16.57	3.26	17.58	3.54	18.59	3.82	19.00	3.82	19.40	3.87
23.00	12.17	2.33	14.37	2.90	16.57	3.47	17.58	3.77	18.59	4.06	19.00	4.07	19.40	4.11
25.00	12.17	2.47	14.37	3.09	16.57	3.69	17.58	4.01	18.59	4.32	19.00	4.33	19.40	4.38
27.00	12.17	2.63	14.37	3.28	16.57	3.93	17.58	4.26	18.59	4.60	19.00	4.60	19.40	4.66
29.00	12.17	2.80	14.37	3.49	16.57	4.18	17.58	4.53	18.59	4.89	19.00	4.90	19.40	4.95
31.00	12.17	2.98	14.37	3.72	16.57	4.44	17.58	4.82	18.59	5.20	19.00	5.21	19.40	5.27
33.00	12.17	3.17	14.37	3.95	16.57	4.73	17.58	5.13	18.59	5.53	19.00	5.54	19.40	5.60
35.00	12.17	3.37	14.37	4.21	16.57	5.03	17.58	5.46	18.59	5.89	19.00	5.90	19.40	5.97
37.00	12.17	3.44	14.37	4.29	16.57	5.13	17.58	5.57	18.59	6.01	19.00	6.02	19.40	6.08
39.00	12.17	3.51	14.37	4.38	16.57	5.23	17.58	5.68	18.59	6.13	19.00	6.14	19.40	6.21
41.00	12.17	3.58	14.37	4.46	16.57	5.34	17.58	5.79	18.59	6.25	19.00	6.26	19.40	6.33
43.00	12.17	3.65	14.37	4.55	16.57	5.45	17.58	5.91	18.59	6.37	19.00	6.39	19.40	6.46

Heating

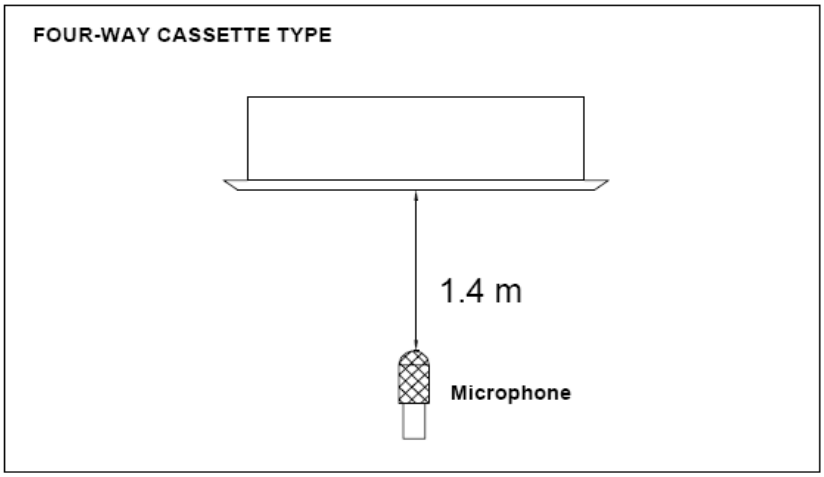
Outdoor air temp.		Indoor temperature(℃ DB)											
		16		18		20		21		22		24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
℃ DB	℃ WB	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
-14.7	-15	12.83	4.58	12.83	4.68	12.83	4.77	12.32	4.57	11.83	4.35	10.80	3.94
-12.6	-13	13.56	4.64	13.56	4.74	13.56	4.84	13.01	4.64	12.49	4.42	11.41	4.00
-10.5	-11	14.27	4.71	14.27	4.81	14.27	4.91	13.70	4.70	13.15	4.48	12.01	4.06
-9.5	-10	14.60	4.78	14.60	4.88	14.60	4.99	14.02	4.77	13.46	4.55	12.29	4.12
-8.5	-9.1	14.95	4.85	14.95	4.96	14.95	5.06	14.35	4.84	13.78	4.61	12.58	4.18
-7	-7.6	15.45	4.92	15.45	5.03	15.45	5.13	14.83	4.91	14.24	4.68	13.00	4.24
-5	-5.6	16.14	4.99	16.14	5.10	16.14	5.21	15.50	4.98	14.88	4.75	13.58	4.30
-3	-3.7	16.82	5.07	16.82	5.18	16.82	5.28	16.15	5.06	15.50	4.82	14.15	4.36
0	-0.7	17.84	5.14	17.84	5.25	17.84	5.36	17.13	5.13	16.44	4.89	15.01	4.43
3	2.2	18.86	5.22	18.86	5.33	18.86	5.44	18.11	5.21	17.39	4.96	15.87	4.49
5	4.1	19.54	5.29	19.54	5.41	19.54	5.52	18.76	5.28	18.01	5.03	16.44	4.56
7	6	20.22	5.37	20.22	5.49	20.22	5.60	19.41	5.36	18.63	5.11	17.01	4.62
9	7.9	20.22	5.19	20.22	5.30	20.22	5.42	19.41	5.18	18.63	4.94	17.01	4.47
11	9.8	20.22	5.01	20.22	5.11	20.22	5.22	19.41	5.00	18.63	4.76	17.01	4.31
13	11.8	20.22	4.83	20.22	4.93	20.22	5.03	19.41	4.82	18.63	4.59	17.01	4.15
15	13.7	20.22	4.65	20.22	4.75	20.22	4.85	19.41	4.64	18.63	4.42	17.01	4.00

8. Electric Characteristics

Model	Indoor Unit				Power Supply	IFM	
	Hz	Voltage	Min	Max	MFA	kW	FLA
CCT 50 INV-Si	50	220-240	198	254	15	0.06	0.44
CCT 70 INV-Si	50	220-240	198	254	15	0.065	0.56
CCT 90 INV-Si	50	220-240	198	254	15	0.09	0.77
CCT 100 INV-Si	50	220-240	198	254	15	0.09	0.77
CCT 140 INV-Si	50	220-240	198	254	15	0.09	0.77
CCT 170 INV-Si	50	220-240	207	253	15	0.09	0.8

Remark:
MFA: Max. Fuse Amps. (A)
KW: Fan Motor Rated Output (KW)
FLA: Full Load Amps. (A)
IFM: Indoor Fan Motor

9. Sound Levels



Model	Noise level dB(A)		
	H	M	L
CCT 50 INV-Si	40	38.5	37
CCT 70 INV-Si	42	40.5	39
CCT 90 INV-Si	44	42.5	41
CCT 100 INV-Si	44	42.5	41
CCT 140 INV-Si	44	42.5	41
CCT 170 INV-Si	46	44	42

Part 3
Outdoor Units

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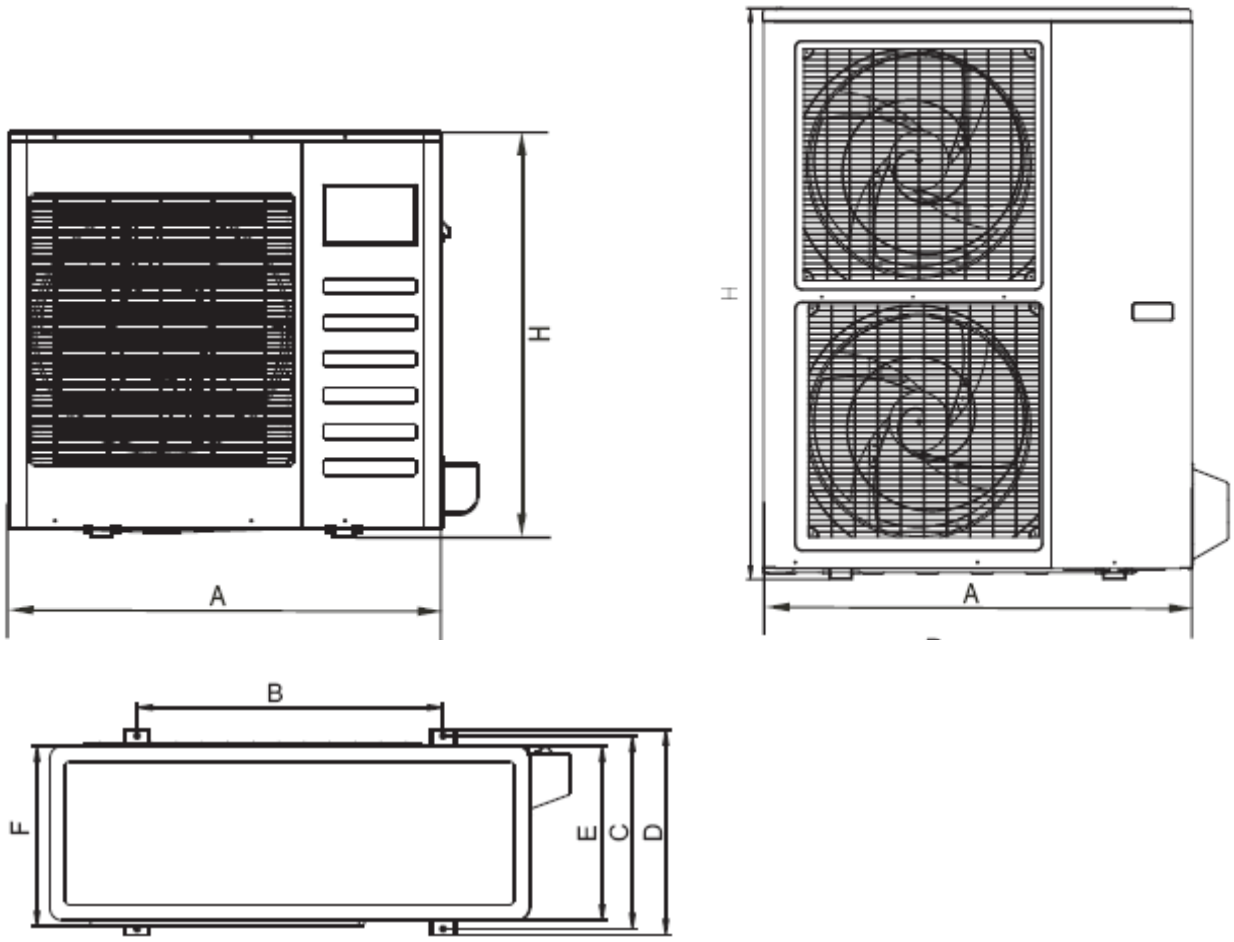
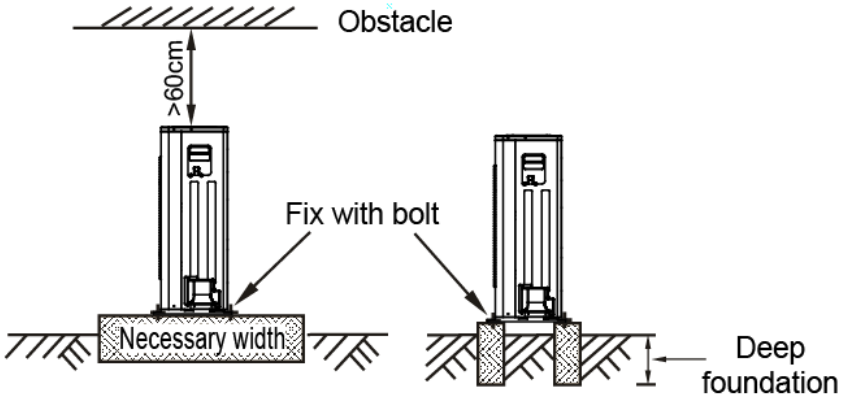
1. Dimensions

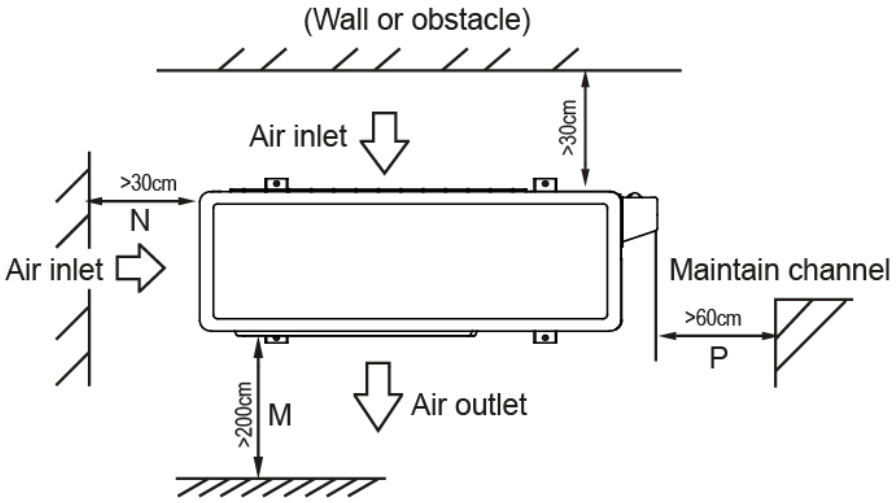


Unit: mm

MODEL	A	B	C	D	E	F	H
CCT 301 INVo **CFT 35 INV-Ro** **DCT 35 INV-So**	761	530	290	315	270	279	593
CCT 501 INVo **CCT 50 INV-So** **CFT 50 INV-Ro** **DCT 50 INV-So**	842	560	335	360	312	324	695
CCT 70 INV-So **CFT 70 INV-Ro** **DCT 70 INV-So**	895	862	313	355	302	80	862
CCT 90 INV-So **CFT 90 INV-Ro** **DCT 90 INV-So**	990	624	366	396	340	354	966
CCT 100 INV-So-1 **CFT 100 INV-Ro-1** **DCT 100 INV-So-1**	940	600	376	400	340	360	1245
CCT 100 INV-So **CFT 100 INV-Ro** **DCT 100 INV-So**	990	624	366	396	340	354	966
CCT 140 INV-So-1 **CFT 140 INV-Ro-1** **DCT 140 INV-So-1**	940	600	376	400	340	360	1245
CCT 140 INV-So **CFT 140 INV-Ro** **DCT 140 INV-So**	940	600	376	400	340	360	1245
CCT 170 INV-So **CFT 170 INV-Ro** **DCT 170 INV-So**	940	600	376	400	340	360	1245
DHP 170 INV -Ro	940	600	376	400	340	360	1245

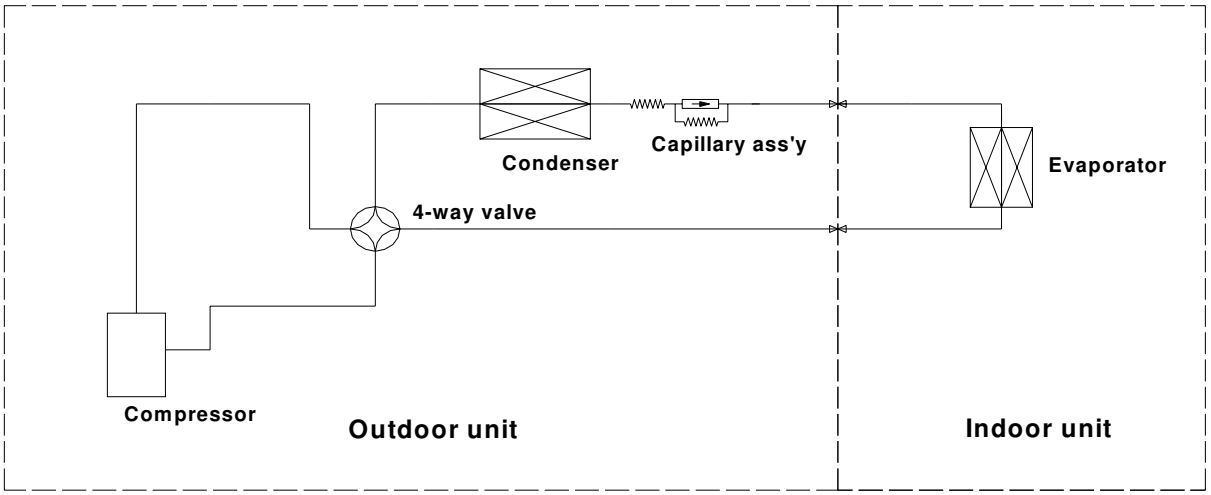
2. Service Space



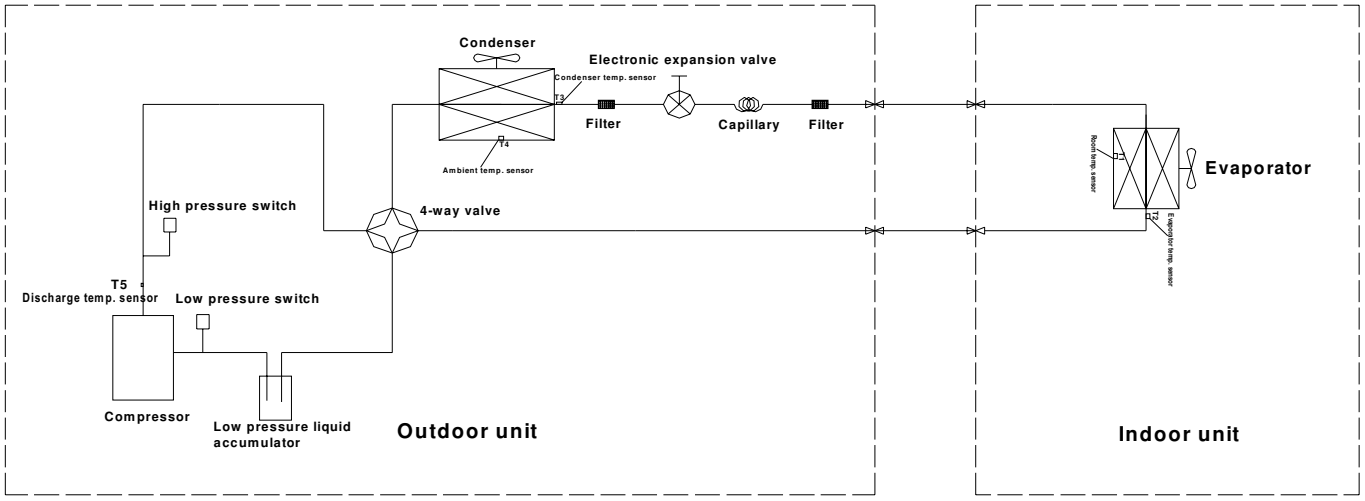


3. Piping Diagrams

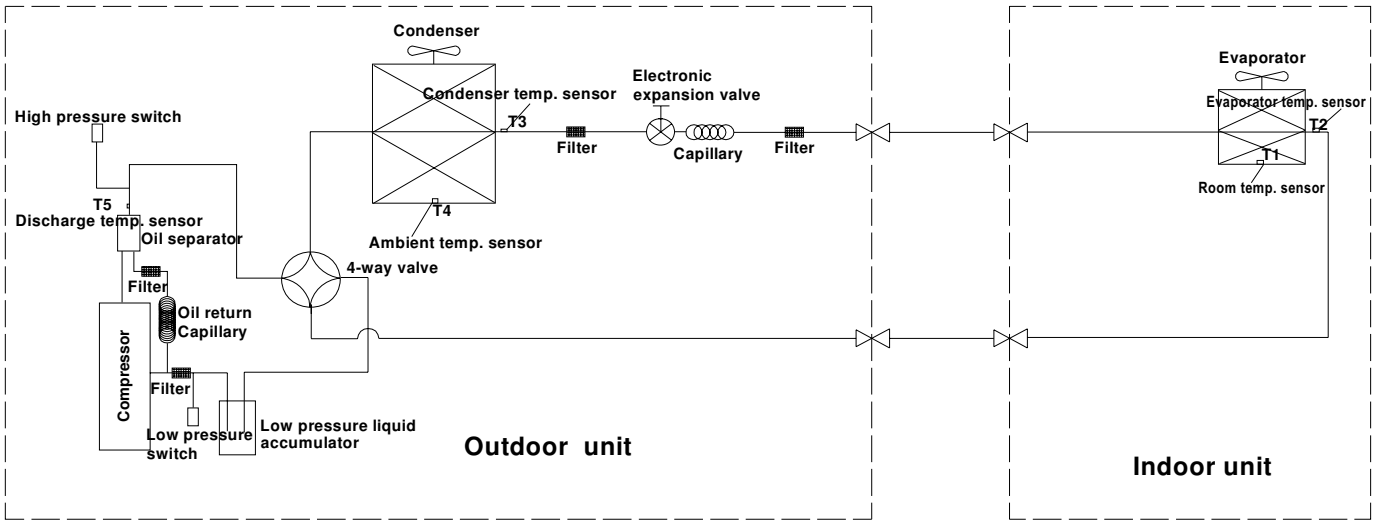
CCT 301 INVo, CFT 35 INV-Ro, DCT 35 INV-So



CCT 501 INVo, CCT 50 INV-So, CFT 50 INV-Ro, DCT 50 INV-So
CCT 70 INV-So, CFT 70 INV-Ro, DCT 70 INV-So

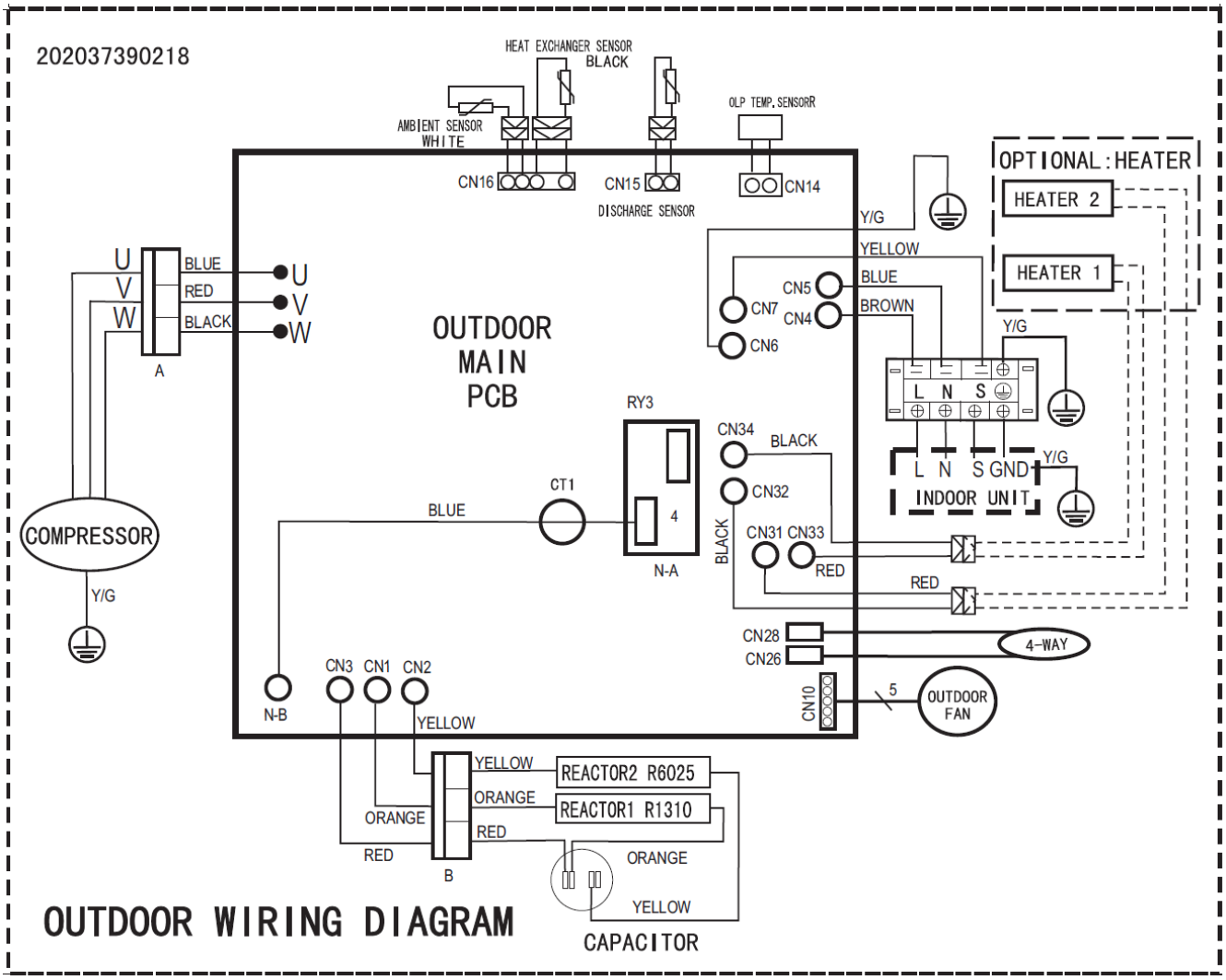


CCT 90 INV-So, CFT 90 INV-Ro, DCT 90 INV-So,
CCT 100 INV-So-1, CFT 100 INV-Ro-1, DCT 100 INV-So-1
CCT 100 INV-So, CFT 100 INV-Ro, DCT 100 INV-So,
CCT 140 INV-So-1, CFT 140 INV-Ro-1, DCT 140 INV-So-1
CCT 140 INV-So, CFT 140 INV-Ro, DCT 140 INV-So,
CCT 170 INV-So, CFT 170 INV-Ro, DCT 170 INV-So, DHP 170 INV -Ro

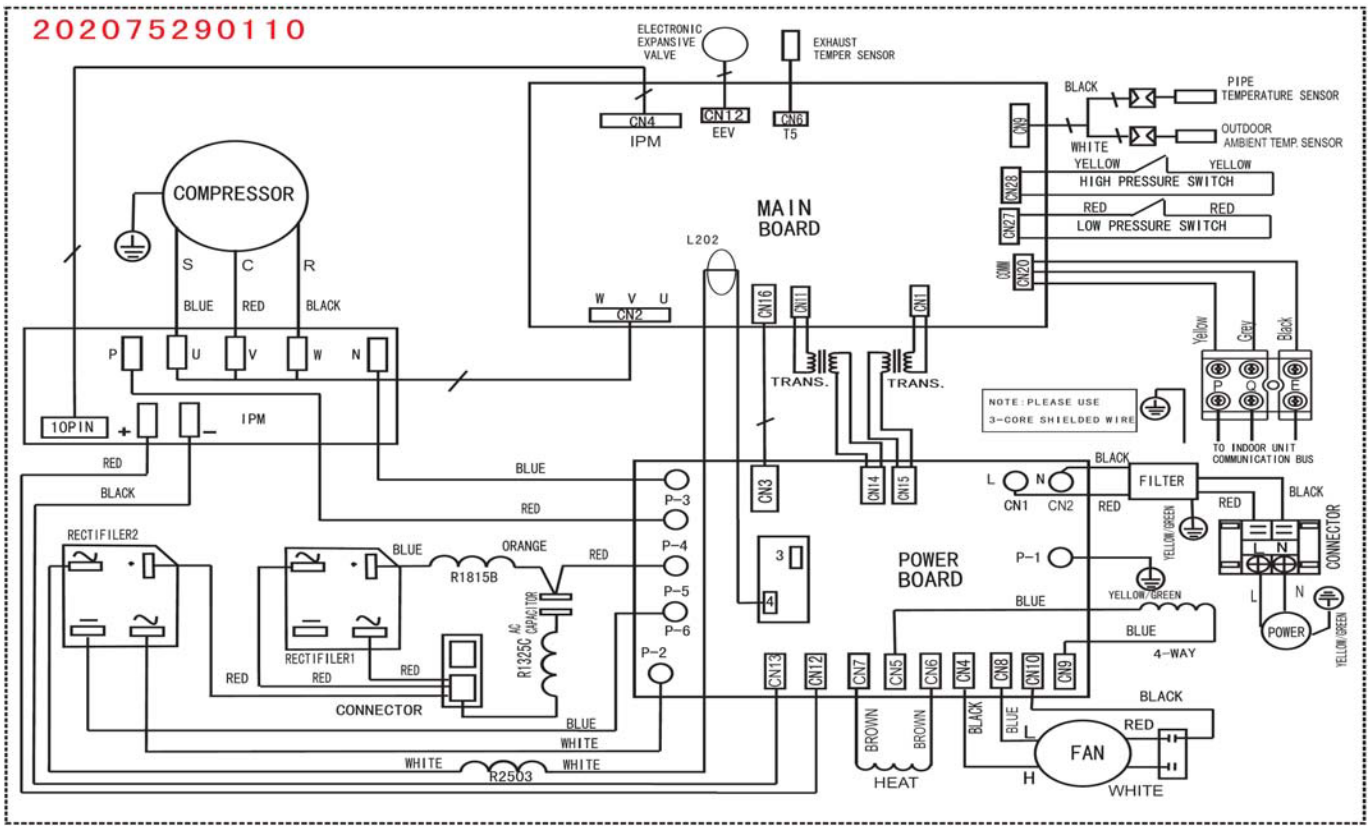


4. Wiring Diagrams

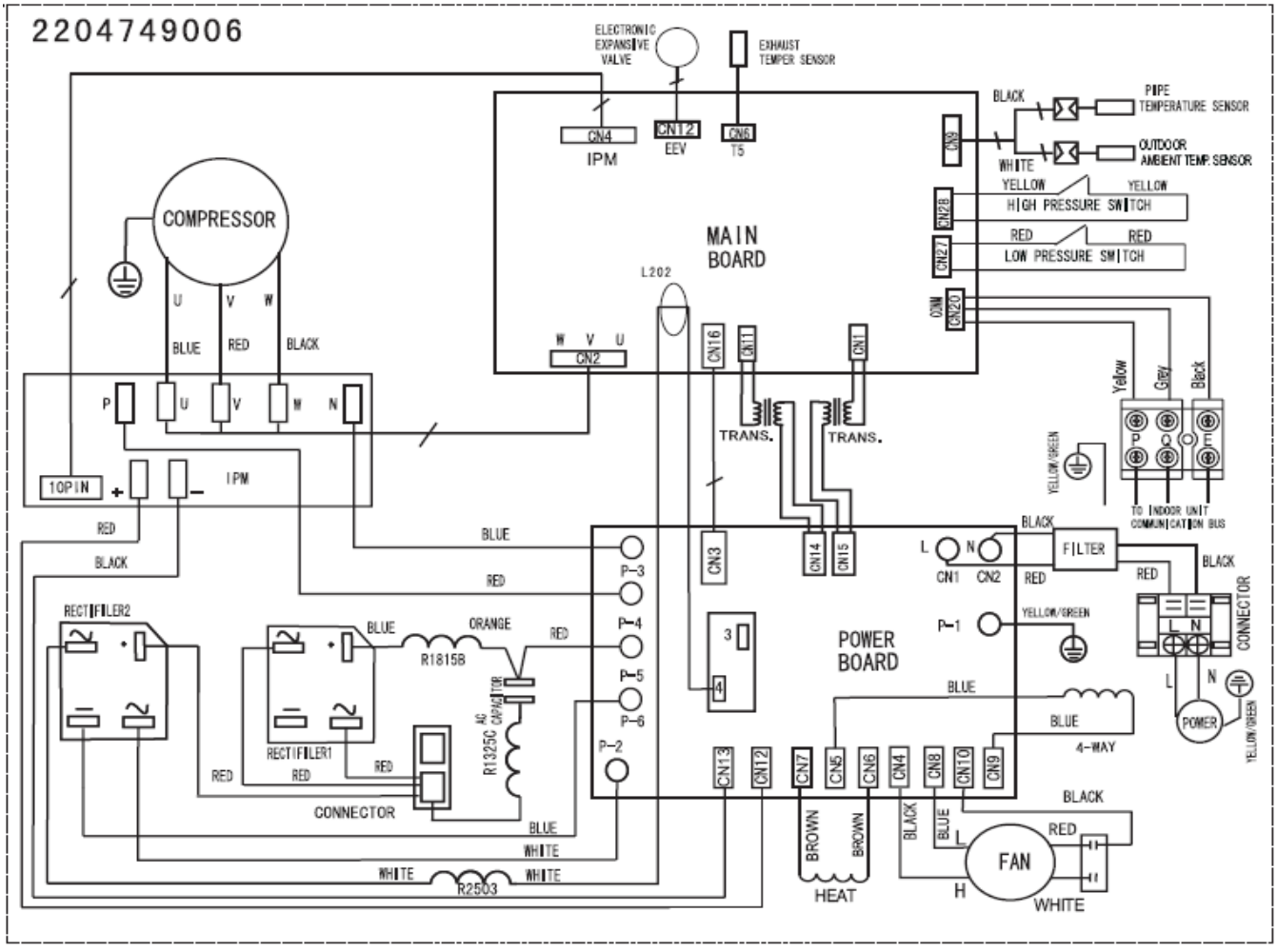
CCT 301 INVo, CFT 35 INV-Ro, DCT 35 INV-So



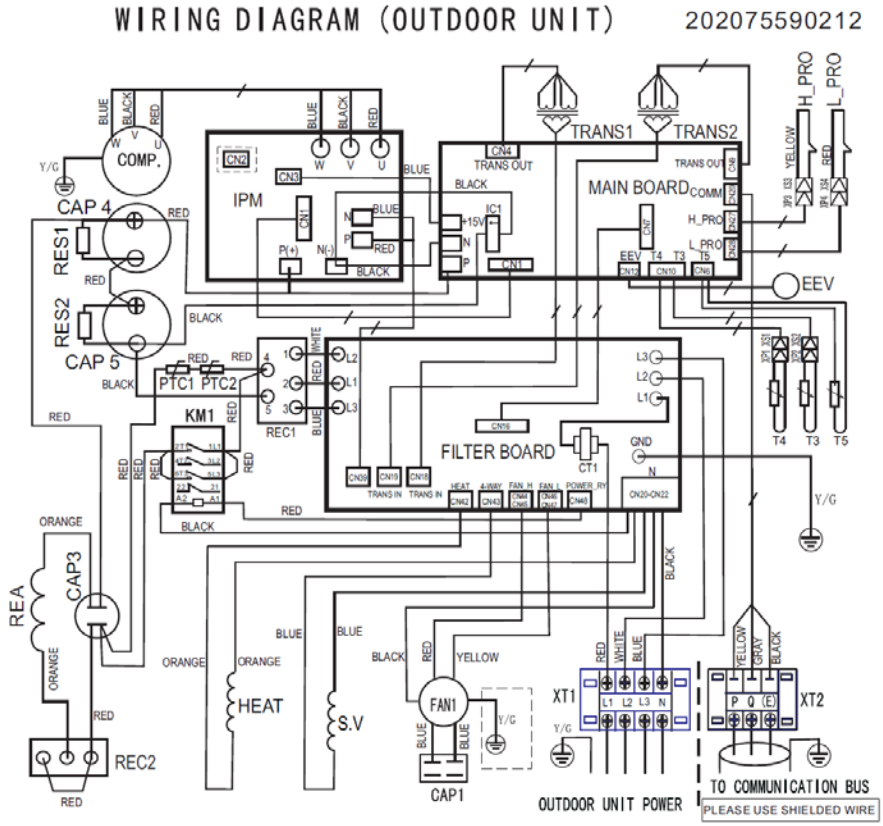
CCT 501 INVo, CCT 50 INV-So, CFT 50 INV-Ro, DCT 50 INV-So



CCT 70 INV-So, CFT 70 INV-Ro, DCT 70 INV-So



CCT 100 INV-So, CFT 100 INV-Ro, DCT 100 INV-So

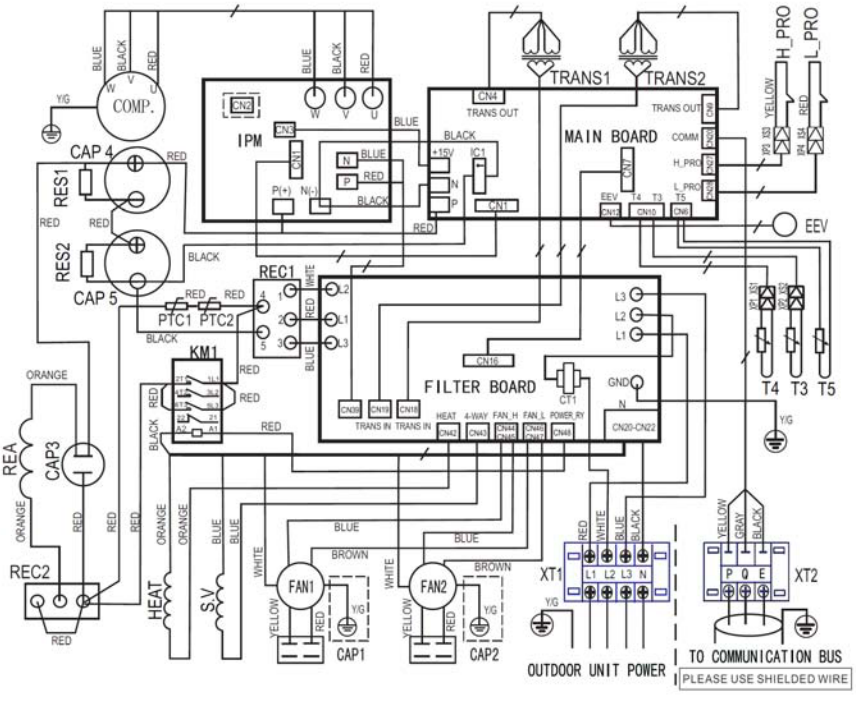


CODE	PART NAME
COMP.	COMPRESSOR
CAP1-CAP5	CAPACITOR
CT1, IC1	CURRENT DETECTOR
EEV	ELECTRIC EXPANSIVE VALVE
FAN1	OUTDOOR FAN MOTOR
HEAT	CRANKCASE HEATING
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
KM1	AC CONTACTOR
PTC1,PTC2	PTC ELEMENT
REA	REACTOR
REC1,REC2	RECTIFIER
RES1,RES2	RESISTANCE
S.V	4-WAY VALVE
TRANS1,TRANS2	TRANSFORMOR
T3	CONDENSER TEMPERATURE SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
T5	COMP. DISCHARGE TEMPERATURE SENSOR
XS1-XS2	CONNECTOR
XP1-XP2	CONNECTOR
XT1	4-WAY TERMINAL
XT2	SMALL 3-WAY TERMINAL

Malfunction Code for Outdoor unit

Display	Malfunction or Protection
E0	EEPROM malfunction
E2	Communication malfunction between indoor/outdoor units
E3	Communication malfunction of outdoor unit controller
E4	Outdoor unit temperature sensor malfunction
E5	Power voltage protection
P1	High pressure protection
P2	Low pressure protection
P3	Current protection
P4	Compressor discharge temperature protection
P5	Condenser high temperature protection
P6	Inverter module protection

CCT 140 INV-So, CFT 140 INV-Ro, DCT 140 INV-So,
CCT 170 INV-So, CFT 170 INV-Ro, DCT 170 INV-So



CODE	PART NAME
COMP.	COMPRESSOR
CAP1-CAP5	CAPACITANCE
CT1,IC1	CURRENT DETECTOR
EEV	ELECTRIC EXPANSIVE VALVE
FAN1,FAN2	OUTDOOR FAN MOTOR
HEAT	CRANKCASE HEATING
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
KM1	AC CONTACTOR
PTC1,PTC2	PTC ELEMENT
REA	REACTOR
REC1,REC2	RECTIFIER
RES1,RES2	RESISTANCE
S.V	4-WAY VALVE
TRANS1,TRANS2	TRANSFORMOR
T3	CONDENSER TEMPERATURE SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
T5	COMP. DISCHARGE TEMPERATURE SENSOR
XS1-XS2	CONNECTOR
XP1-XP2	CONNECTOR
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XT2	SMALL 3-WAY TERMINAL

Malfunction Code for Outdoor unit

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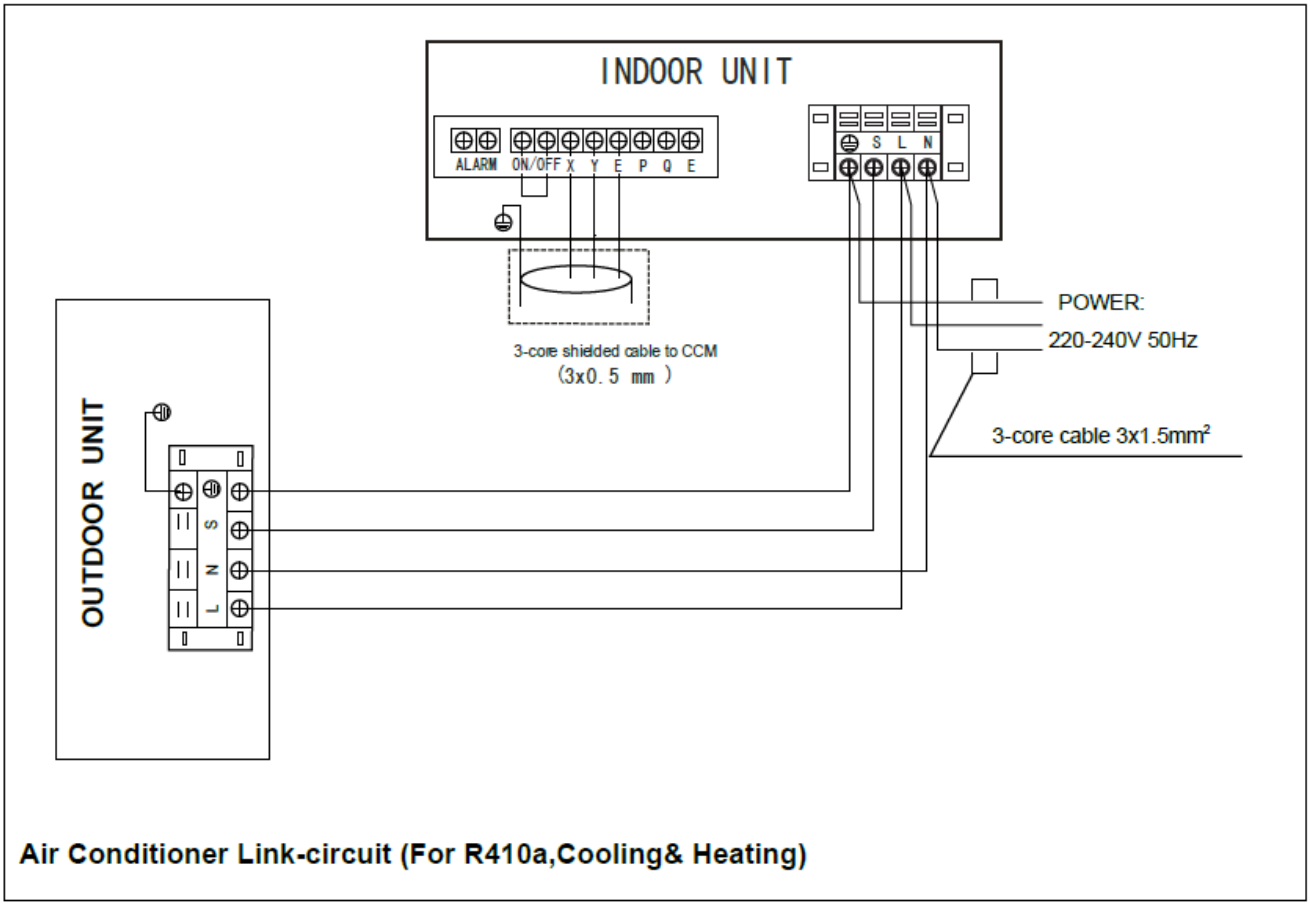
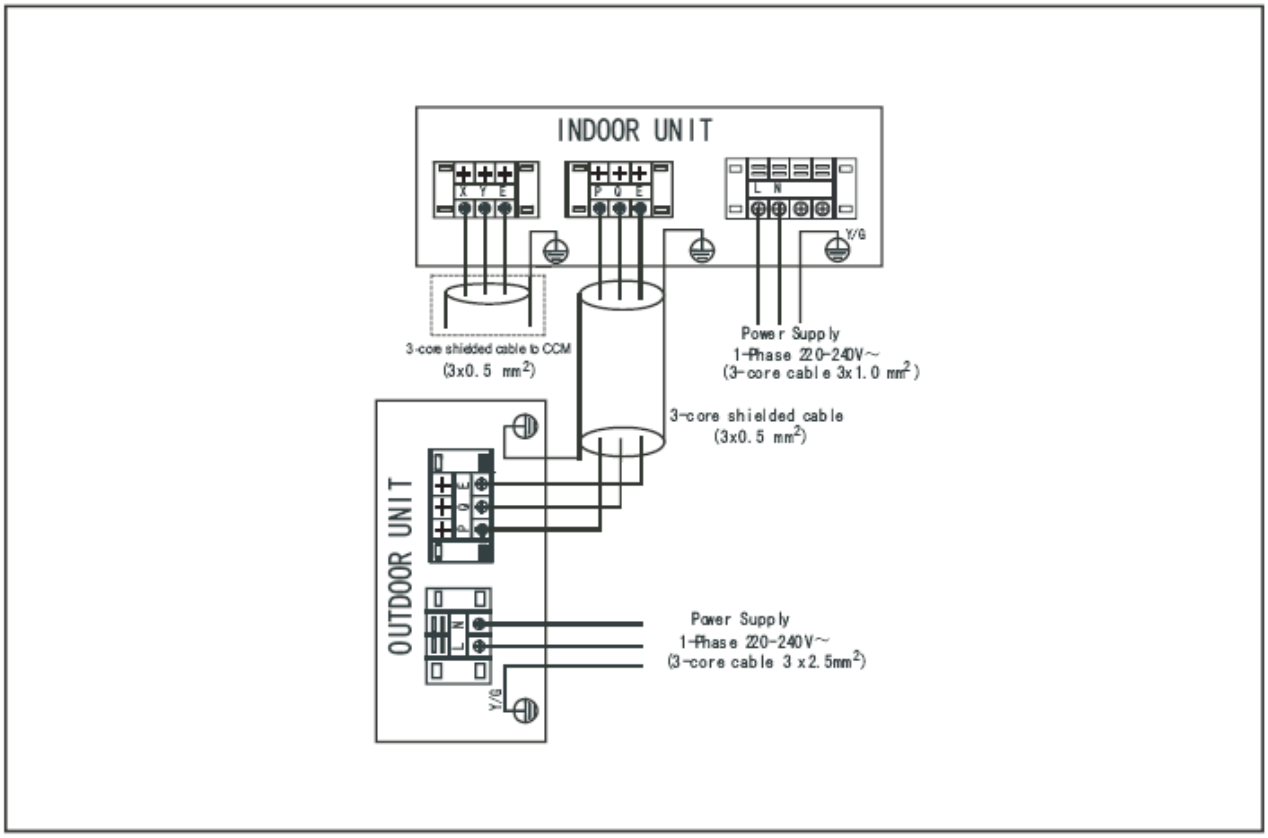
E5	Power voltage protection
P1	High pressure protection
P2	Low pressure protection
P3	Current protection
P4	Compressor discharge temperature protection
P5	Condenser high temperature protection
P6	Inverter module protection

5. Field Wiring

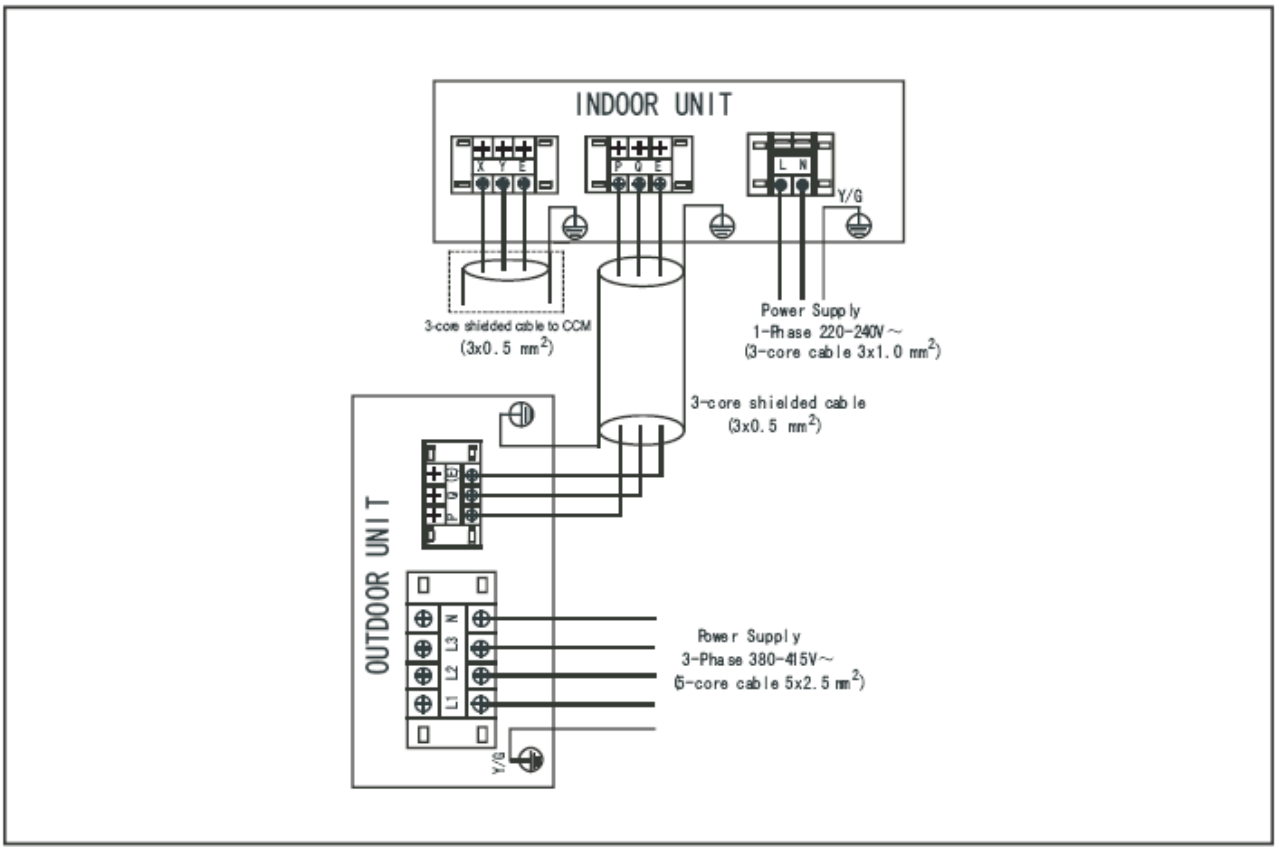


Air Conditioner Link-circuit (For R410a,Cooling& Heating)

For 12000Btu/h (with -1Phase outdoor unit)



For 18000-24000Btu/h (with 1-phase outdoor unit)



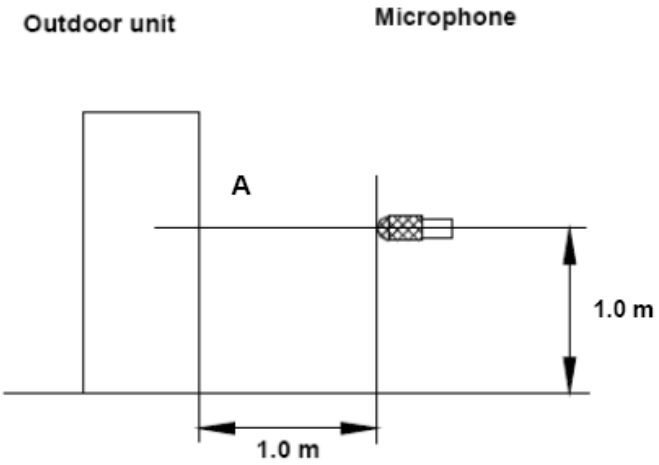
For 36000-60000Btu/h (with 3-phase outdoor unit)

6. Electric Characteristics

Model	Outdoor Unit				Power Supply		Compressor	OFM	
	Hz	Voltage	Min.	Max.	TOCA	MFA	RLA	kW	FLA
CCT 301 INVo CFT 35 INV-Ro DCT 35 INV-So	50	220-240	198	254	10	30	5.3	0.024	0.3
CCT 501 INVo CCT 50 INV-So CFT 50 INV-Ro DCT 50 INV-So	50	220-240	198	254	20	30	8.96	0.053	0.59
CCT 70 INV-So CFT 70 INV-Ro DCT 70 INV-So	50	220-240	198	254	20	30	10.4	0.053	0.67
CCT 90 INV-So CFT 90 INV-Ro DCT 90 INV-So	50	220-240	198	254	20	40	13.5	0.2	1.4
CCT 100 INV-So-1 CFT 100 INV-Ro-1 DCT 100 INV-So-1	50	220-240	198	254	30	40	13.6	0.1×2	0.8
CCT 140 INV-So-1 CFT 140 INV-Ro-1 DCT 140 INV-So-1	50	220-240	198	254	30	40	13.6	0.1×2	0.8
CCT 100 INV-So CFT 100 INV-Ro DCT 100 INV-So	50	380	342	440	20	40	9.3	0.2	1.4
CCT 140 INV-So CFT 140 INV-Ro DCT 140 INV-So	50	380	342	440	20	40	9.3	0.1×2	0.8×2
CCT 170 INV-So CFT 170 INV-Ro DCT 170 INV-So	50	380	342	440	20	40	15.2	0.1×2	0.8×2
DHP 170 INV -Ro	50	380-415	342	440	20	40	15.2	0.1×2	0.8×2

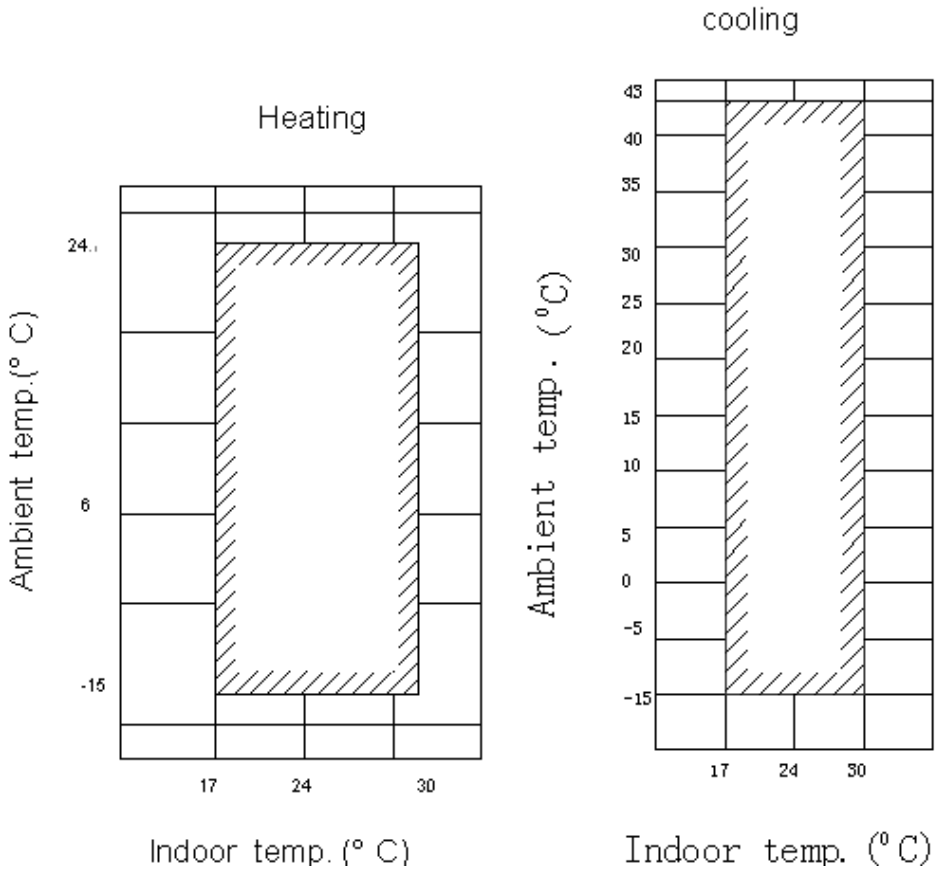
Remark:
TOCA: Total Over-current Amps. (A)
MFA: Max. Fuse Amps. (A)
RLA: Rated Locked Amps. (A)
OFM: Outdoor Fan Motor.
FLA: Full Load Amps. (A)
KW: Rated Motor Output (KW)

7. Sound Levels



Model	Noise level dB(A)
	H/L
CCT 301 INVo **CFT 35 INV-Ro** **DCT 35 INV-So**	48/44
CCT 501 INVo **CCT 50 INV-So** **CFT 50 INV-Ro** **DCT 50 INV-So**	51/46
CCT 70 INV-So **CFT 70 INV-Ro** **DCT 70 INV-So**	58/55
CCT 90 INV-So **CFT 90 INV-Ro** **DCT 90 INV-So**	55/50
CCT 100 INV-So-1 **CFT 100 INV-Ro-1** **DCT 100 INV-So-1**	57/52
CCT 140 INV-So-1 **CFT 140 INV-Ro-1** **DCT 140 INV-So-1**	59/54
CCT 100 INV-So **CFT 100 INV-Ro** **DCT 100 INV-So**	55/50
CCT 140 INV-So **CFT 140 INV-Ro** **DCT 140 INV-So**	59/54
CCT 170 INV-So **CFT 170 INV-Ro** **DCT 170 INV-So**	59/54
DHP 170 INV -Ro	59/54

9. Operation Limits

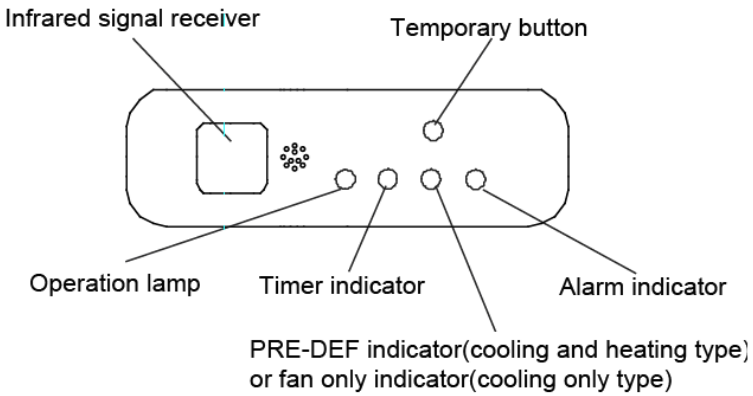


10. Troubleshooting

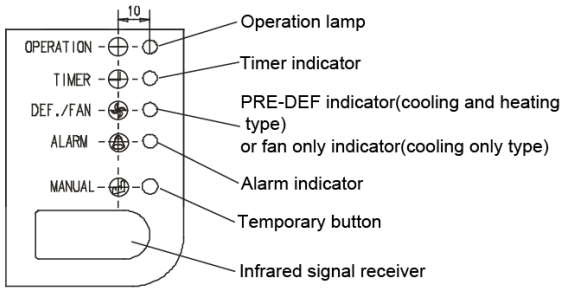
10.1 Indoor unit malfunction

10.1.1 Display board

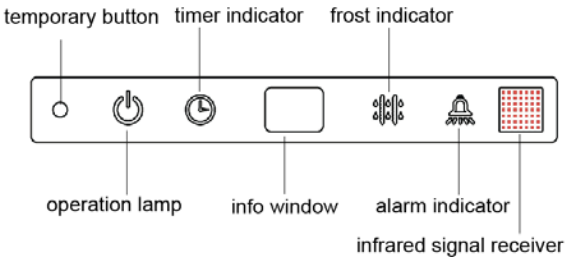
Compact 4-way cassette



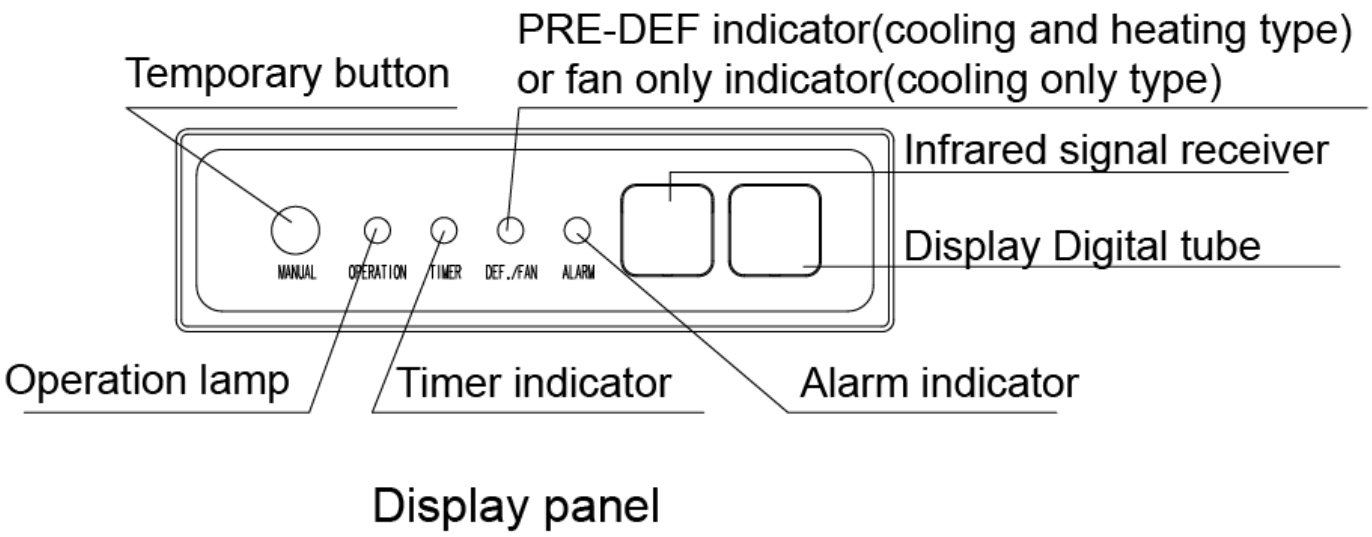
Ceiling & Floor



Normal 4-way cassette



Duct



10.1.2 Troubleshooting

For Normal 4-way cassette

No	Malfunction	Operation lamp	Timer lamp	Defrosting lamp	Alarm lamp	Display
1	Communication malfunction between in-outdoor unit		LED2 Quick-flash			E1
2	Room temperature sensor malfunction	LED1 Quick-flash				E2
3	Pipe temperature sensor malfunction	LED1 Quick-flash				E3
4	Pipe temperature sensor malfunction	LED1 Quick-flash				E4
5	Water-level alarm				LED4 Quick-flash	EE
6	EEPROM malfunction	LED1 Slow-flash				E7
7	Mode conflicts malfunction			LED3 Quick-flash		E0
8	Outdoor malfunction				LED4 Slow-flash	Ed

For ceiling & floor & compact 4-way cassette

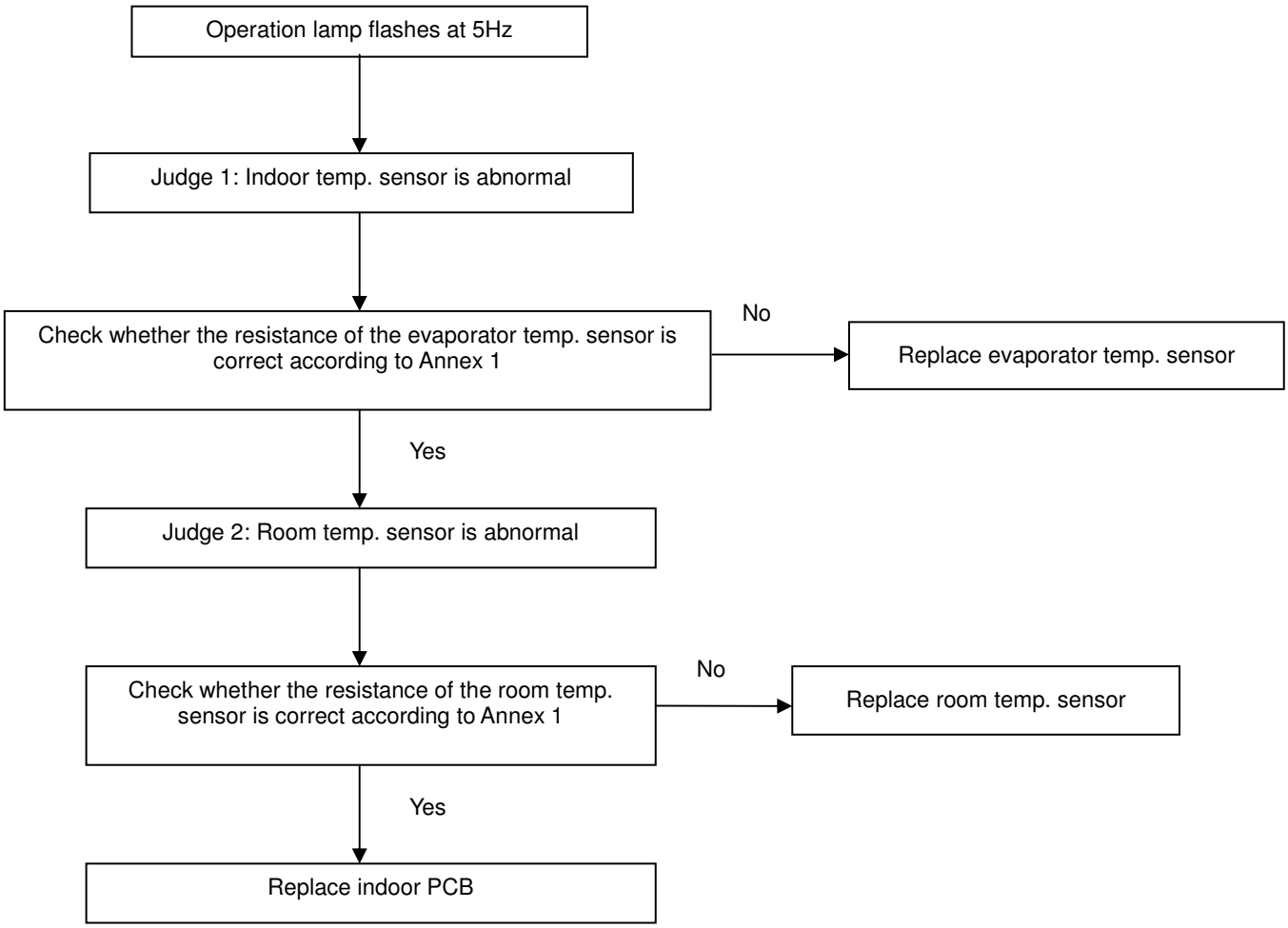
No	Malfunction	Operation lamp	Timer lamp	Defrosting lamp	Alarm lamp
1	Communication malfunction between in-outdoor unit		LED2 Quick-flash		
2	Room temperature sensor malfunction	LED1 Quick-flash			
3	Water-level alarm				LED4 Quick-flash
4	Mode conflicts malfunction			LED3 Quick-flash	
5	Outdoor malfunction				LED4 Slow-flash

For Duct type

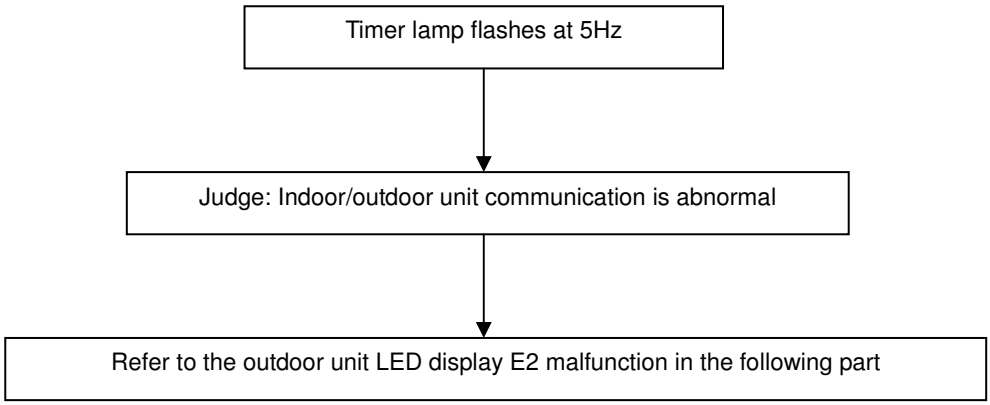
No	Malfunction & protection define	LED1 OPERATION	LED2 TIMER	LED3 DEF.FAN	LED4 ALARM	Display Digital Tube
1	Collision mode malfunction			☆		E0
2	In-Outdoor unit COMM. Checking channel is abnormal		☆			E1
3	Room TEMP. sensor checking channel is abnormal	☆				E2
4	Pipe TEMP. Sensor checking channel is abnormal(T2)	☆				E3
5	Pipe TEMP. Sensor checking channel is abnormal(T2B)	☆				E4
6	EPPROM malfunction	⊙				E7
7	Water-level alarm malfunction				☆	EE
8	Outdoor malfunction				⊙	Ed
9	Be closed by the remote control function	⊙				CP
10	Anti-cold & Defrost	●		●		

● Extinguish ☆Flashing at 5HZ ⊙Flashing at 1HZ

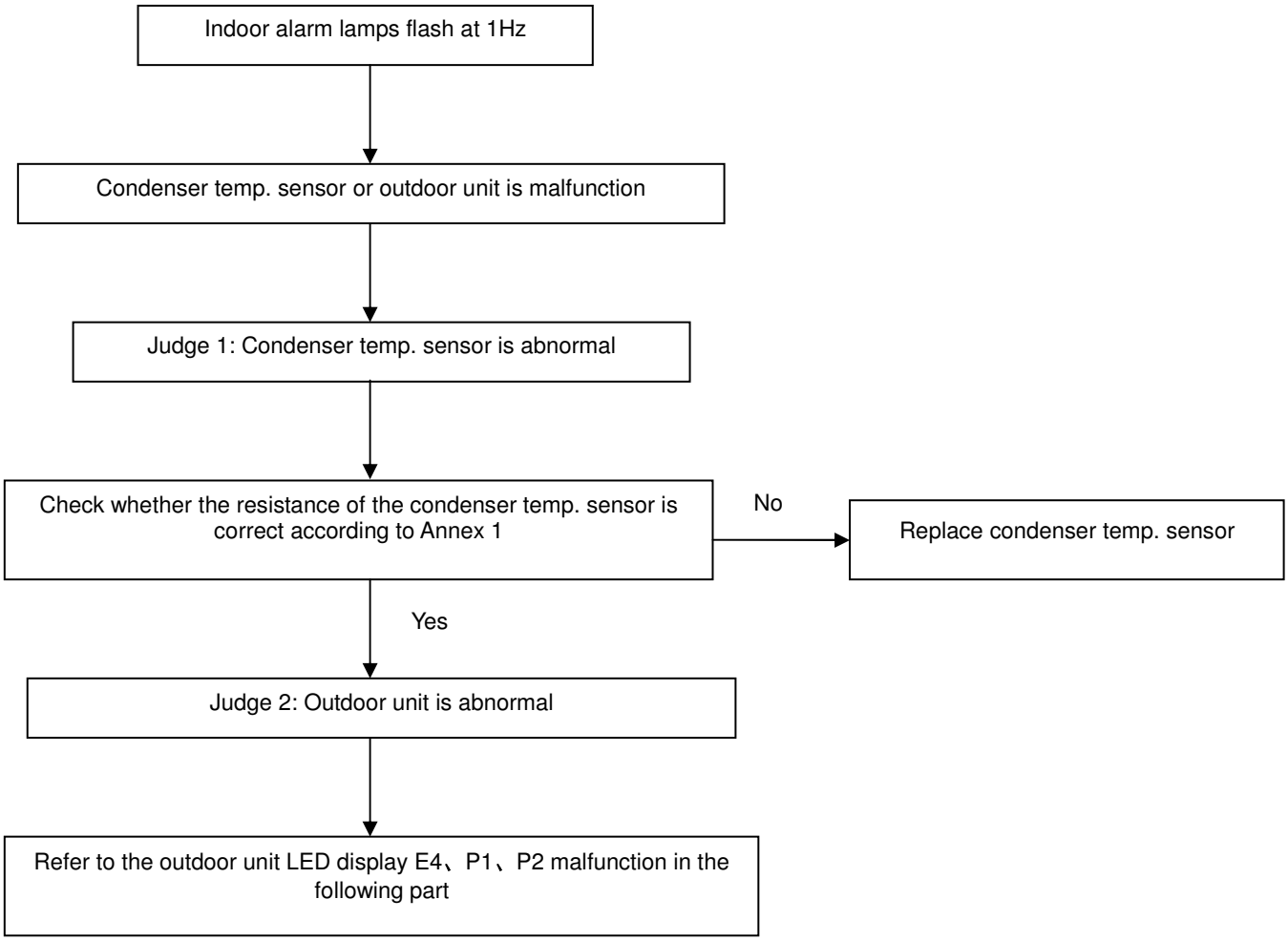
1. Operation lamp flashes


Operation lamp flashes at 5Hz
Judge 1: Indoor temp. sensor is abnormal
Check whether the resistance of the evaporator temp. sensor is correct according to Annex 1
No
Replace evaporator temp. sensor
Yes
Judge 2: Room temp. sensor is abnormal
Check whether the resistance of the room temp. sensor is correct according to Annex 1
No
Replace room temp. sensor
Yes
Replace indoor PCB

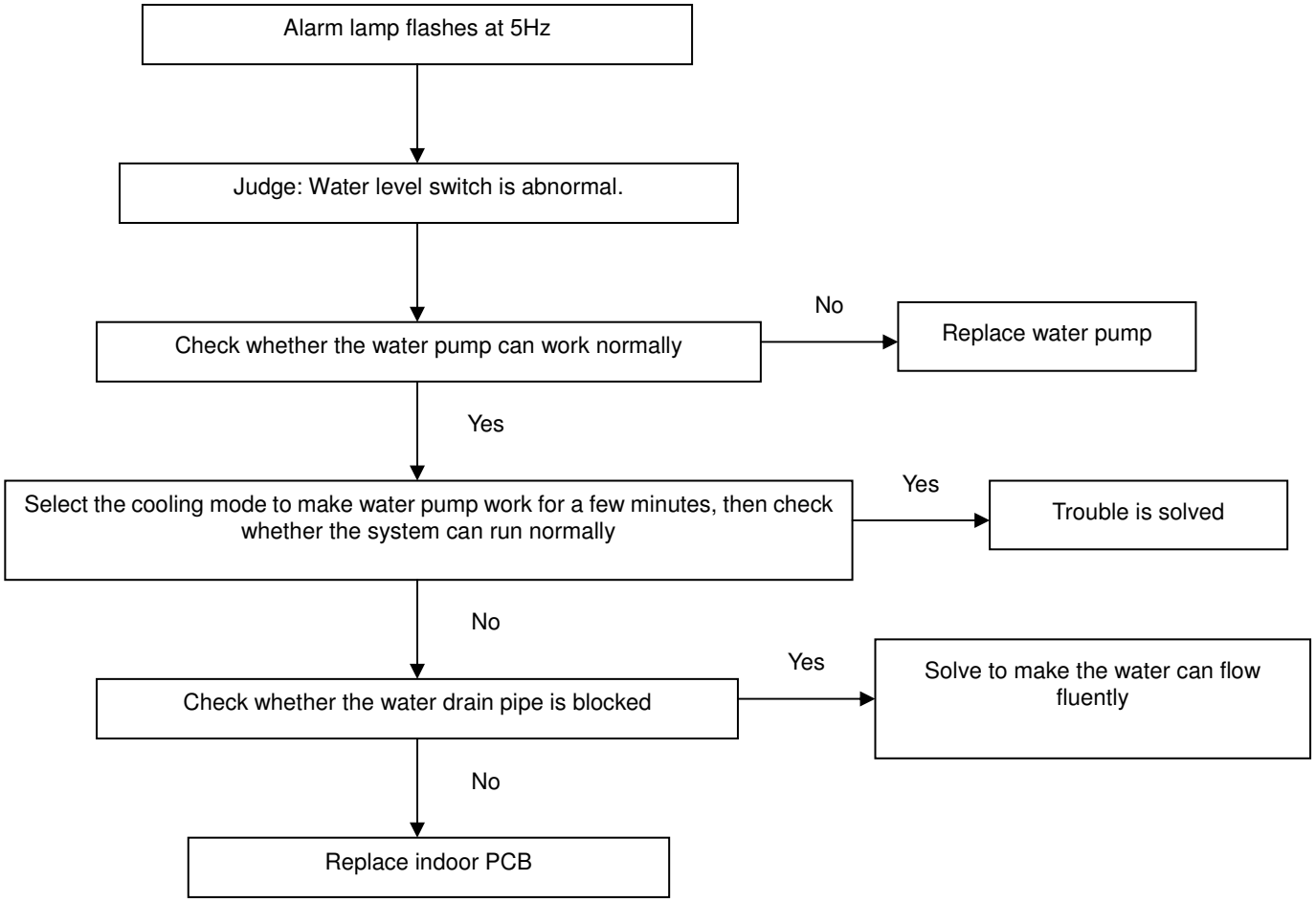
2. Timer lamp flashes


Timer lamp flashes at 5Hz
Judge: Indoor/outdoor unit communication is abnormal
Refer to the outdoor unit LED display E2 malfunction in the following part

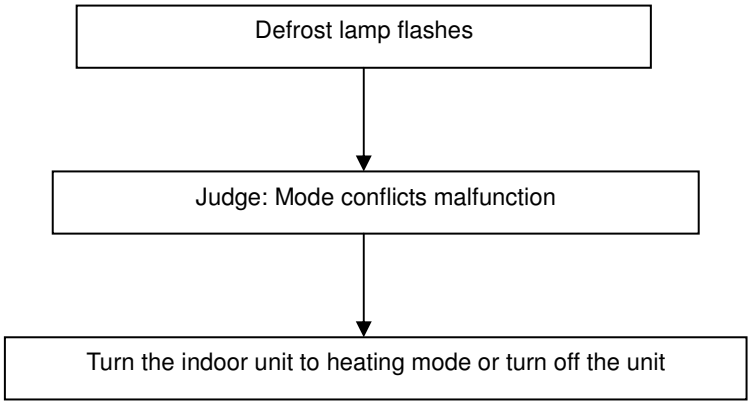
3. Alarm lamp slow-flash


Indoor alarm lamps flash at 1Hz
Condenser temp. sensor or outdoor unit is malfunction
Judge 1: Condenser temp. sensor is abnormal
Check whether the resistance of the condenser temp. sensor is correct according to Annex 1
No
Replace condenser temp. sensor
Yes
Judge 2: Outdoor unit is abnormal
Refer to the outdoor unit LED display E4、P1、P2 malfunction in the following part

4. Alarm lamp quick-flash


Alarm lamp flashes at 5Hz
Judge: Water level switch is abnormal.
Check whether the water pump can work normally
No
Replace water pump
Yes
Select the cooling mode to make water pump work for a few minutes, then check whether the system can run normally
Yes
Trouble is solved
No
Check whether the water drain pipe is blocked
Yes
Solve to make the water can flow fluently
No
Replace indoor PCB

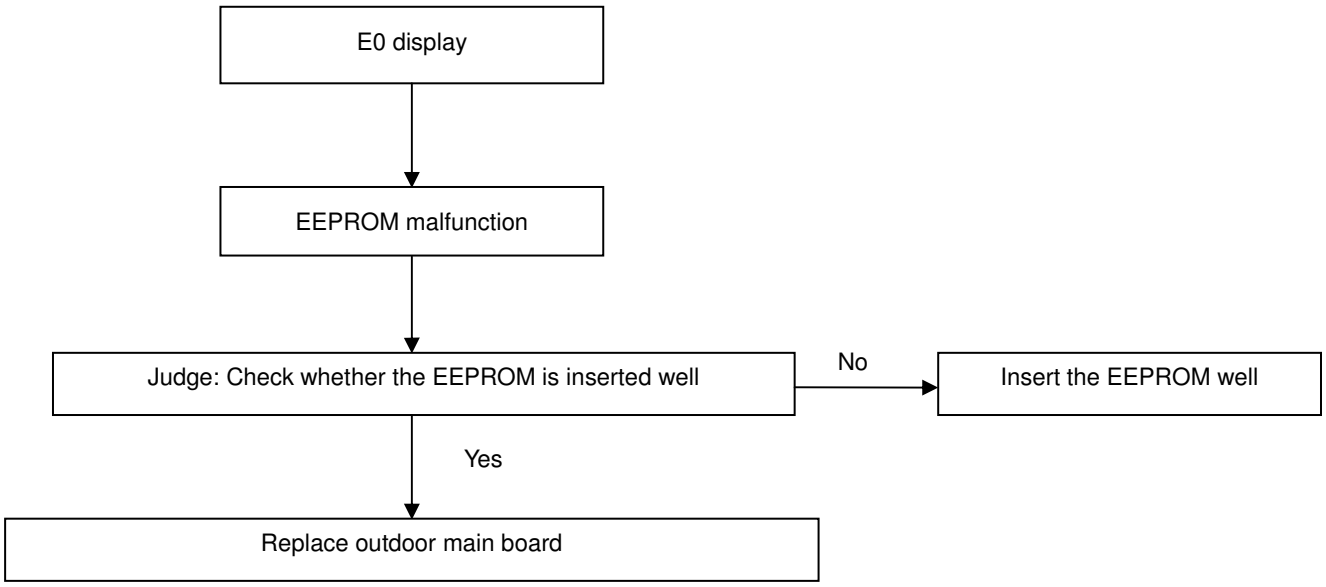
5. Defrost lamp flashes



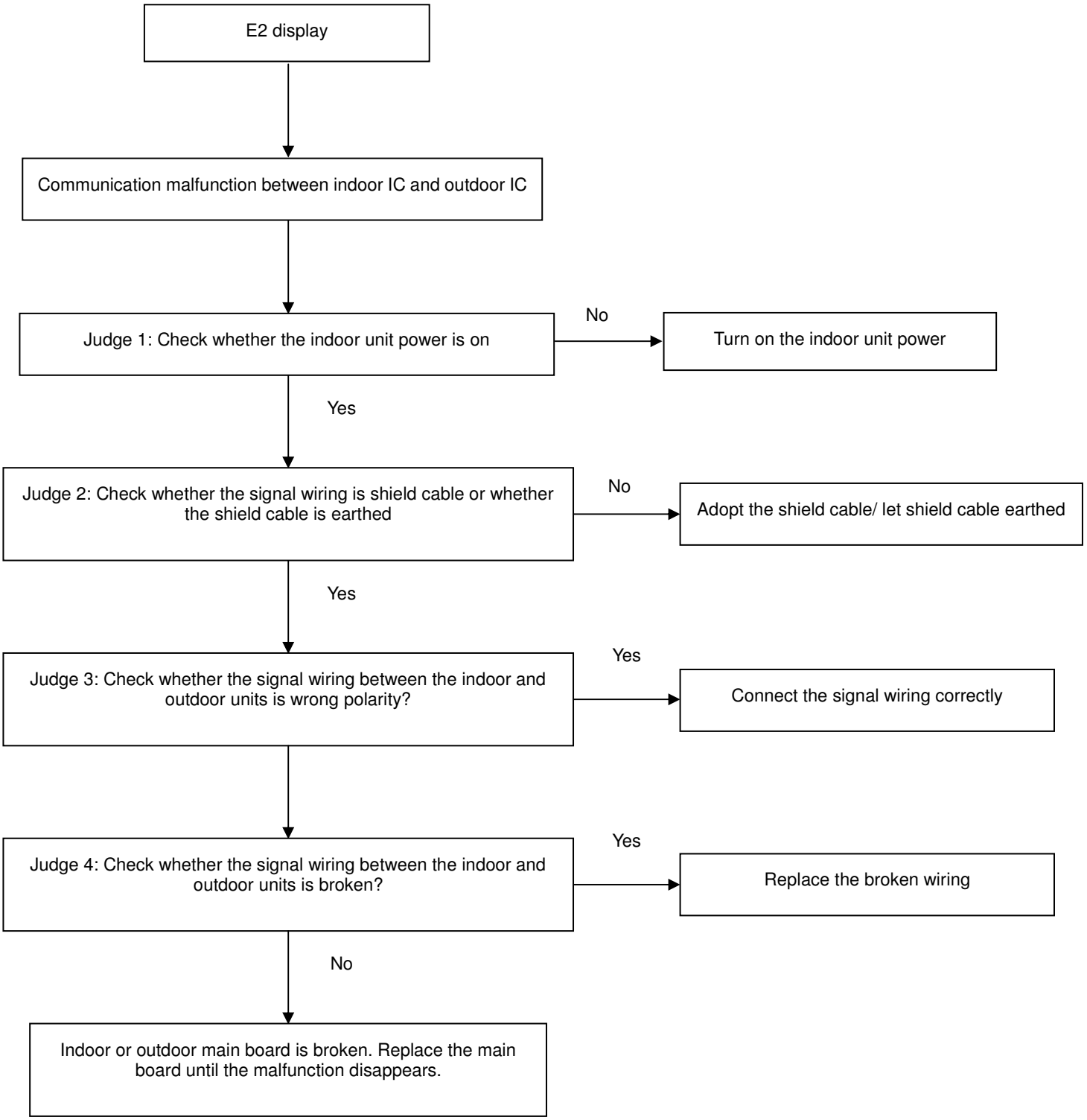
11.2 Outdoor unit malfunction

Display	Malfunction or Protection
E0	EEPROM malfunction
E2	Communication malfunction between indoor IC and outdoor IC
E3	Communication malfunction in outdoor IC and DSP
E4	Malfunction of outdoor temperature sensor
E5	Voltage protection of compressor
E6	PFC module protection (Only for 30K, 36K & 48K with 1 phase)
P0	Top temperature protection of compressor
P1	High pressure protection
P2	Low pressure protection
P3	Current protection of compressor
P4	Discharge temperature protection of compressor
P5	High temperature protection of condenser
P6	Module protection

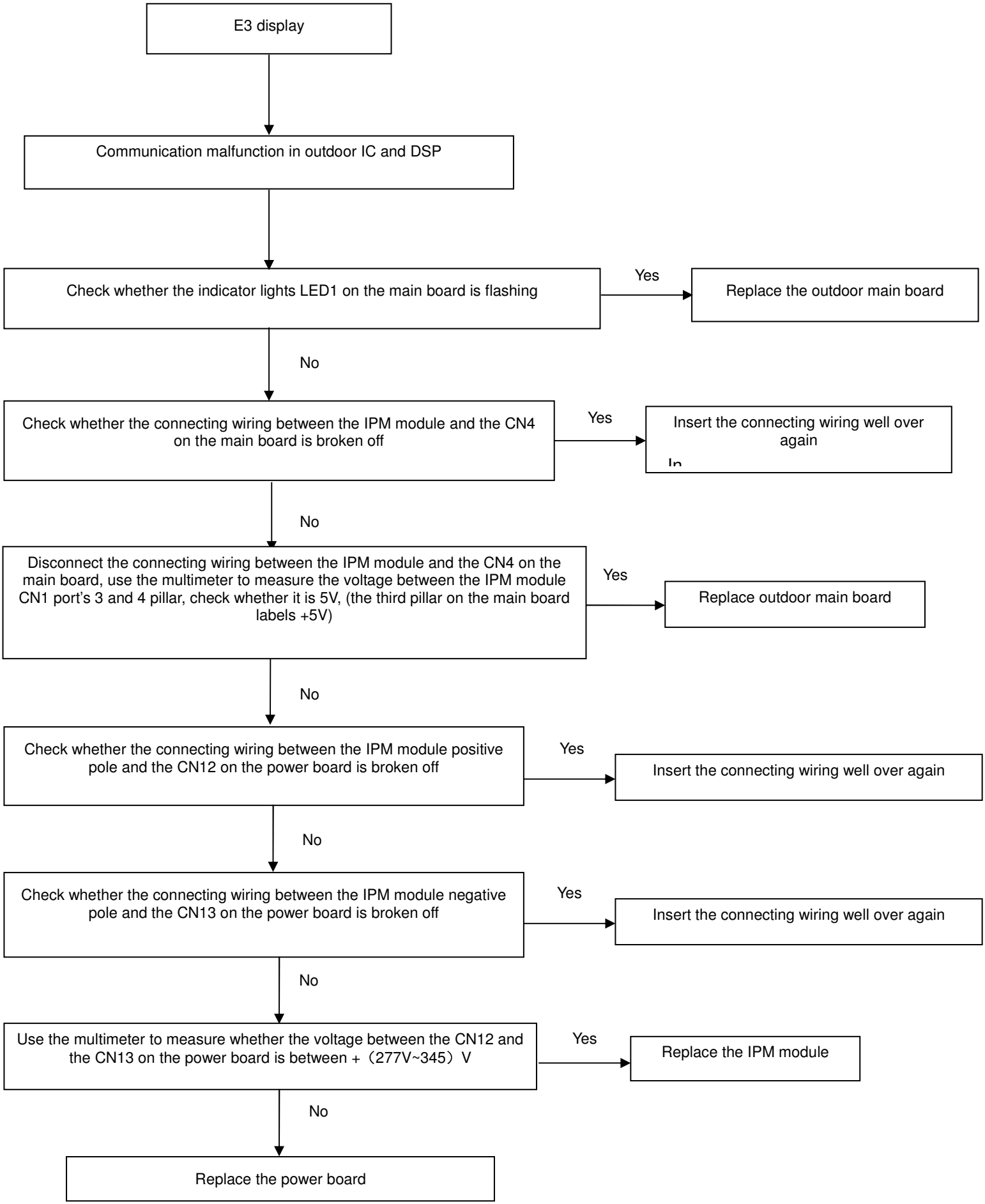
1. E0 malfunction



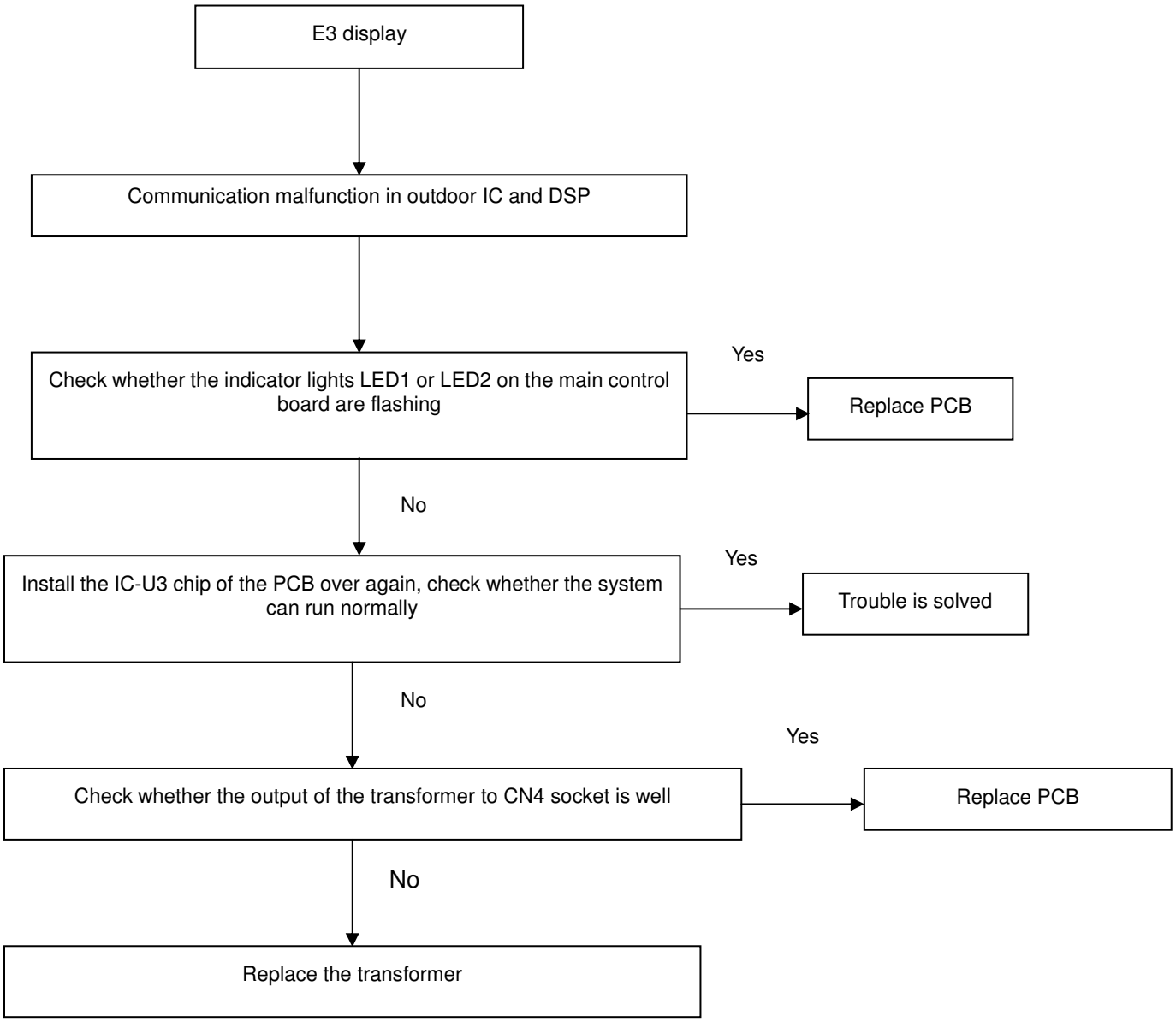
2. E2 malfunction


E2 display
Communication malfunction between indoor IC and outdoor IC
Judge 1: Check whether the indoor unit power is on
No
Turn on the indoor unit power
Yes
Judge 2: Check whether the signal wiring is shield cable or whether the shield cable is earthed
No
Adopt the shield cable/ let shield cable earthed
Yes
Judge 3: Check whether the signal wiring between the indoor and outdoor units is wrong polarity?
Yes
Connect the signal wiring correctly
Judge 4: Check whether the signal wiring between the indoor and outdoor units is broken?
Yes
Replace the broken wiring
No
Indoor or outdoor main board is broken. Replace the main board until the malfunction disappears.

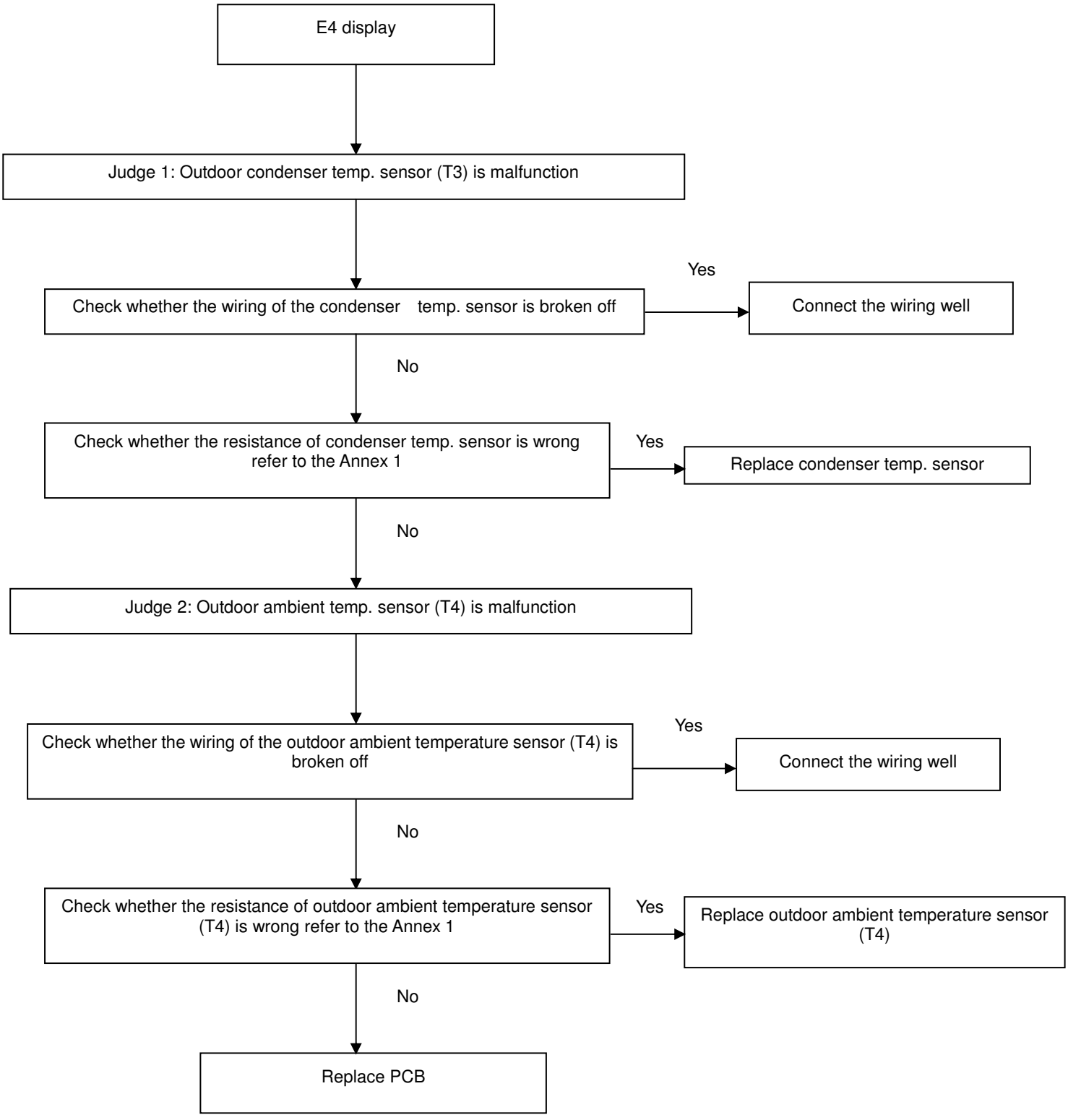
3. E3 malfunction (For 18K & 24K & 30K)


E3 display
Communication malfunction in outdoor IC and DSP
Check whether the indicator lights LED1 on the main board is flashing
Yes
Replace the outdoor main board
No
Check whether the connecting wiring between the IPM module and the CN4 on the main board is broken off
Yes
Insert the connecting wiring well over again
No
Disconnect the connecting wiring between the IPM module and the CN4 on the main board, use the multimeter to measure the voltage between the IPM module CN1 port's 3 and 4 pillar, check whether it is 5V, (the third pillar on the main board labels +5V)
Yes
Replace outdoor main board
No
Check whether the connecting wiring between the IPM module positive pole and the CN12 on the power board is broken off
Yes
Insert the connecting wiring well over again
No
Check whether the connecting wiring between the IPM module negative pole and the CN13 on the power board is broken off
Yes
Insert the connecting wiring well over again
No
Use the multimeter to measure whether the voltage between the CN12 and the CN13 on the power board is between +（277V~345）V
Yes
Replace the IPM module
No
Replace the power board

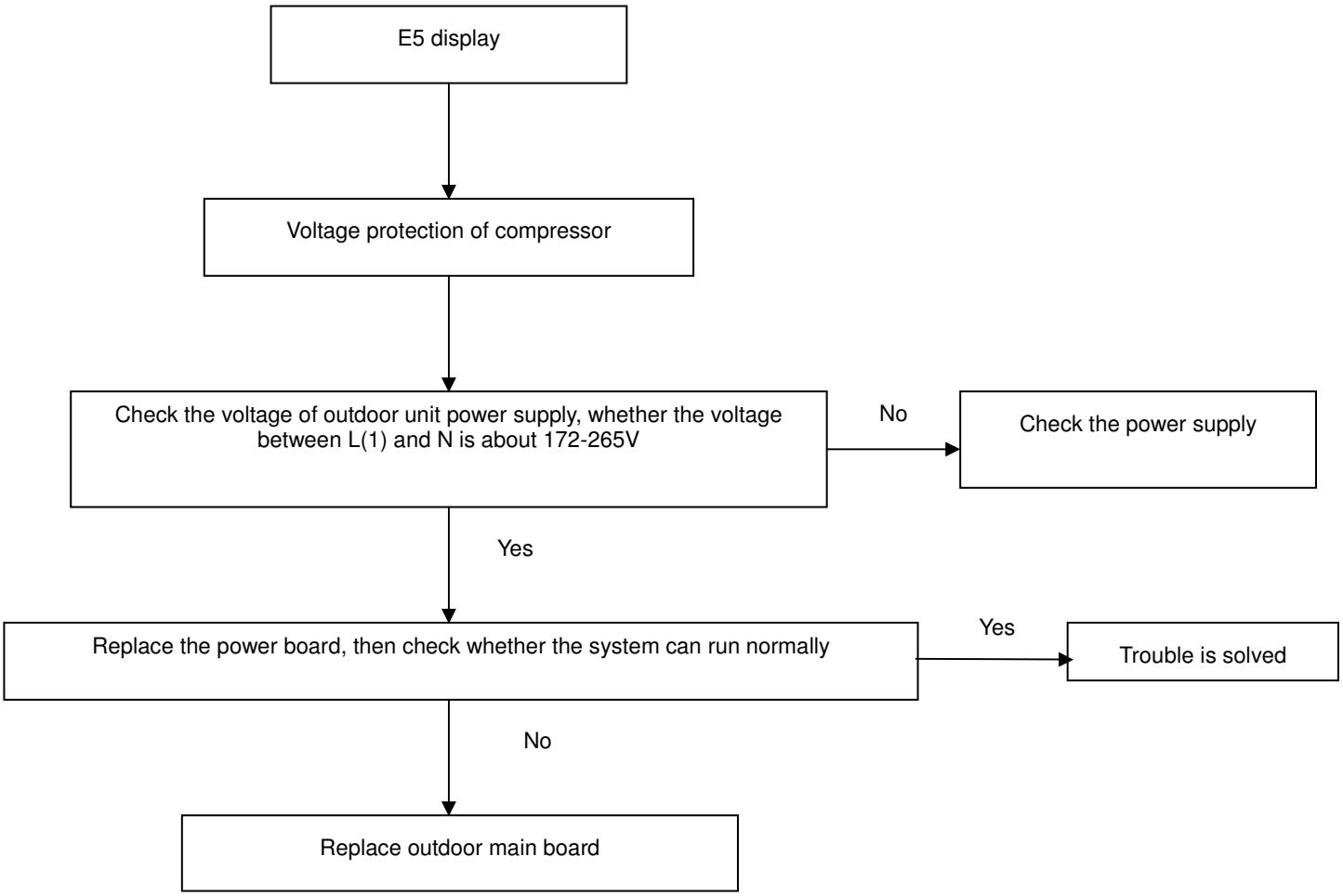
4. E3 malfunction (For 36K & 48K & 60K)


E3 display
Communication malfunction in outdoor IC and DSP
Check whether the indicator lights LED1 or LED2 on the main control board are flashing
Yes
Replace PCB
No
Install the IC-U3 chip of the PCB over again, check whether the system can run normally
Yes
Trouble is solved
No
Check whether the output of the transformer to CN4 socket is well
Yes
Replace PCB
No
Replace the transformer

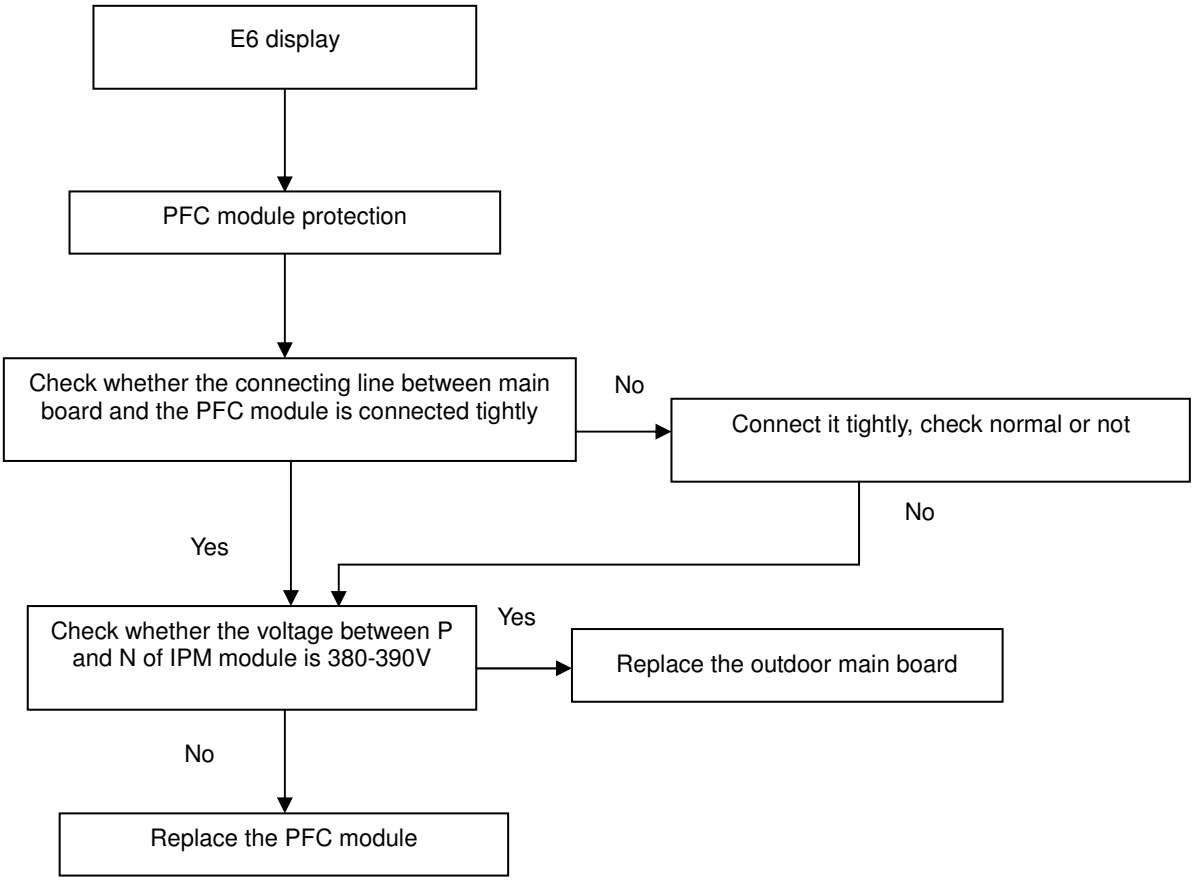
5. E4 malfunction


E4 display
Judge 1: Outdoor condenser temp. sensor (T3) is malfunction
Check whether the wiring of the condenser temp. sensor is broken off
Yes
Connect the wiring well
No
Check whether the resistance of condenser temp. sensor is wrong refer to the Annex 1
Yes
Replace condenser temp. sensor
No
Judge 2: Outdoor ambient temp. sensor (T4) is malfunction
Check whether the wiring of the outdoor ambient temperature sensor (T4) is broken off
Yes
Connect the wiring well
No
Check whether the resistance of outdoor ambient temperature sensor (T4) is wrong refer to the Annex 1
Yes
Replace outdoor ambient temperature sensor (T4)
No
Replace PCB

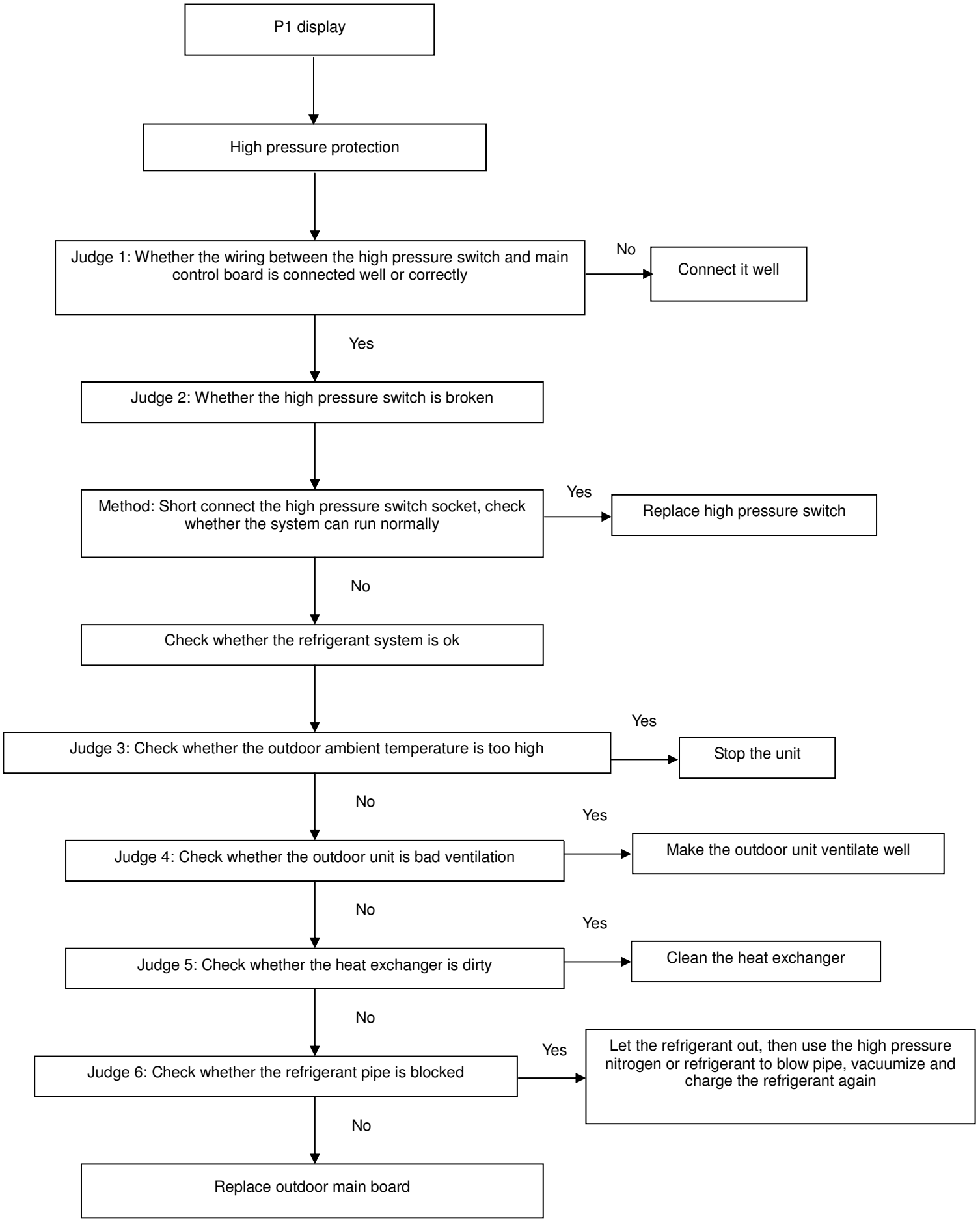
6. E5 malfunction


E5 display
Voltage protection of compressor
Check the voltage of outdoor unit power supply, whether the voltage between L(1) and N is about 172-265V
No
Check the power supply
Yes
Replace the power board, then check whether the system can run normally
Yes
Trouble is solved
No
Replace outdoor main board

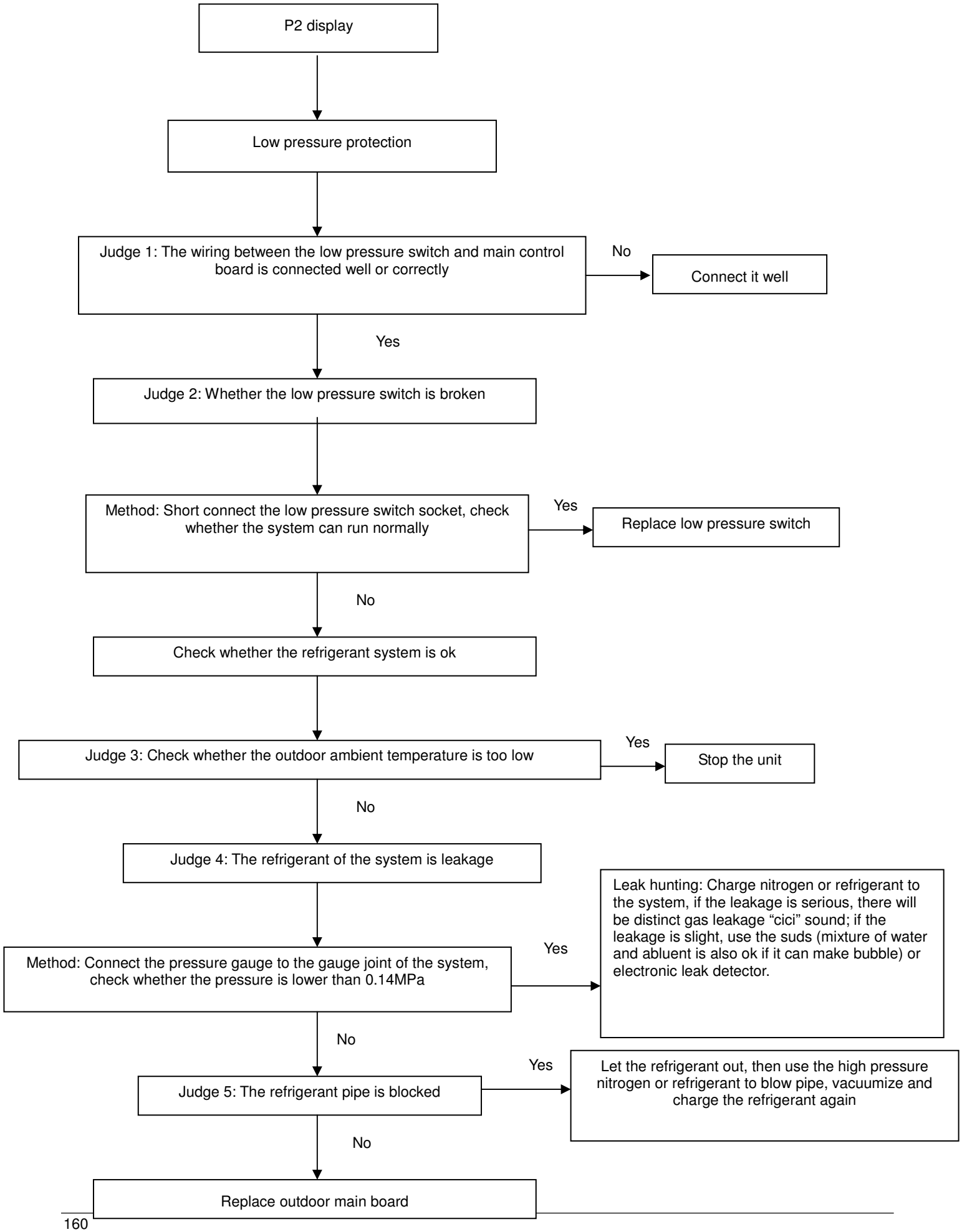
7. E6 malfunction (Only for 30K, 36K & 48K with 1 phase)


E6 display
PFC module protection
Check whether the connecting line between main board and the PFC module is connected tightly
No
Connect it tightly, check normal or not
No
Yes
Check whether the voltage between P and N of IPM module is 380-390V
Yes
Replace the outdoor main board
No
Replace the PFC module

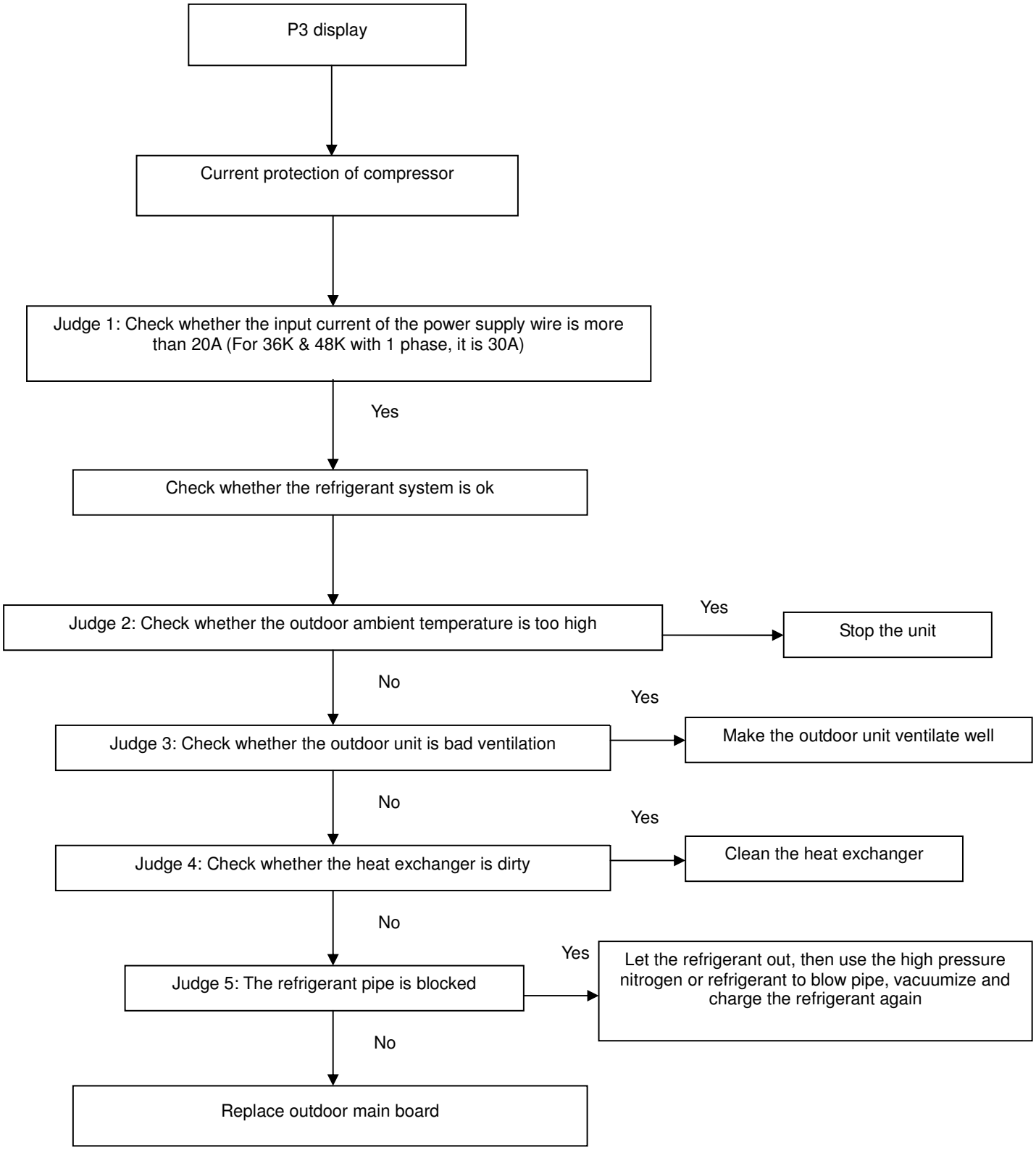
8. P1 malfunction


P1 display
High pressure protection
Judge 1: Whether the wiring between the high pressure switch and main control board is connected well or correctly
No
Connect it well
Yes
Judge 2: Whether the high pressure switch is broken
Method: Short connect the high pressure switch socket, check whether the system can run normally
Yes
Replace high pressure switch
No
Check whether the refrigerant system is ok
Judge 3: Check whether the outdoor ambient temperature is too high
Yes
Stop the unit
No
Judge 4: Check whether the outdoor unit is bad ventilation
Yes
Make the outdoor unit ventilate well
No
Judge 5: Check whether the heat exchanger is dirty
Yes
Clean the heat exchanger
No
Judge 6: Check whether the refrigerant pipe is blocked
Yes
Let the refrigerant out, then use the high pressure nitrogen or refrigerant to blow pipe, vacuumize and charge the refrigerant again
No
Replace outdoor main board

9. P2 malfunction

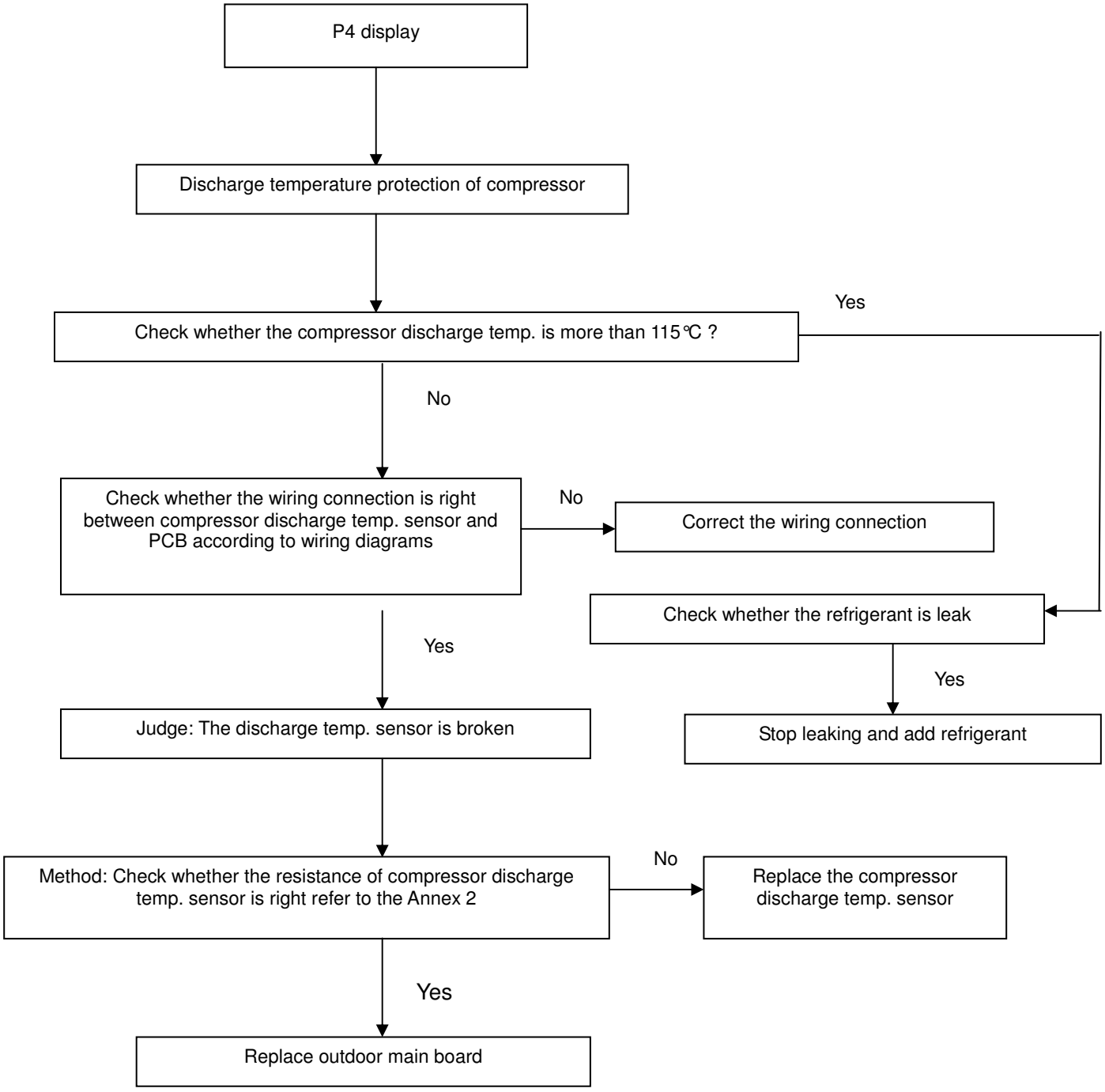

P2 display
Low pressure protection
Judge 1: The wiring between the low pressure switch and main control board is connected well or correctly
No
Connect it well
Yes
Judge 2: Whether the low pressure switch is broken
Method: Short connect the low pressure switch socket, check whether the system can run normally
Yes
Replace low pressure switch
No
Check whether the refrigerant system is ok
Judge 3: Check whether the outdoor ambient temperature is too low
Yes
Stop the unit
No
Judge 4: The refrigerant of the system is leakage
Method: Connect the pressure gauge to the gauge joint of the system, check whether the pressure is lower than 0.14MPa
Yes
Leak hunting: Charge nitrogen or refrigerant to the system, if the leakage is serious, there will be distinct gas leakage “cici” sound; if the leakage is slight, use the suds (mixture of water and abluent is also ok if it can make bubble) or electronic leak detector.
No
Judge 5: The refrigerant pipe is blocked
Yes
Let the refrigerant out, then use the high pressure nitrogen or refrigerant to blow pipe, vacuumize and charge the refrigerant again
No
Replace outdoor main board

10. P3 malfunction


P3 display
Current protection of compressor
Judge 1: Check whether the input current of the power supply wire is more than 20A (For 36K & 48K with 1 phase, it is 30A)
Yes
Check whether the refrigerant system is ok
Judge 2: Check whether the outdoor ambient temperature is too high
Yes
Stop the unit
No
Judge 3: Check whether the outdoor unit is bad ventilation
Yes
Make the outdoor unit ventilate well
No
Judge 4: Check whether the heat exchanger is dirty
Yes
Clean the heat exchanger
No
Judge 5: The refrigerant pipe is blocked
Yes
Let the refrigerant out, then use the high pressure nitrogen or refrigerant to blow pipe, vacuumize and charge the refrigerant again
No
Replace outdoor main board

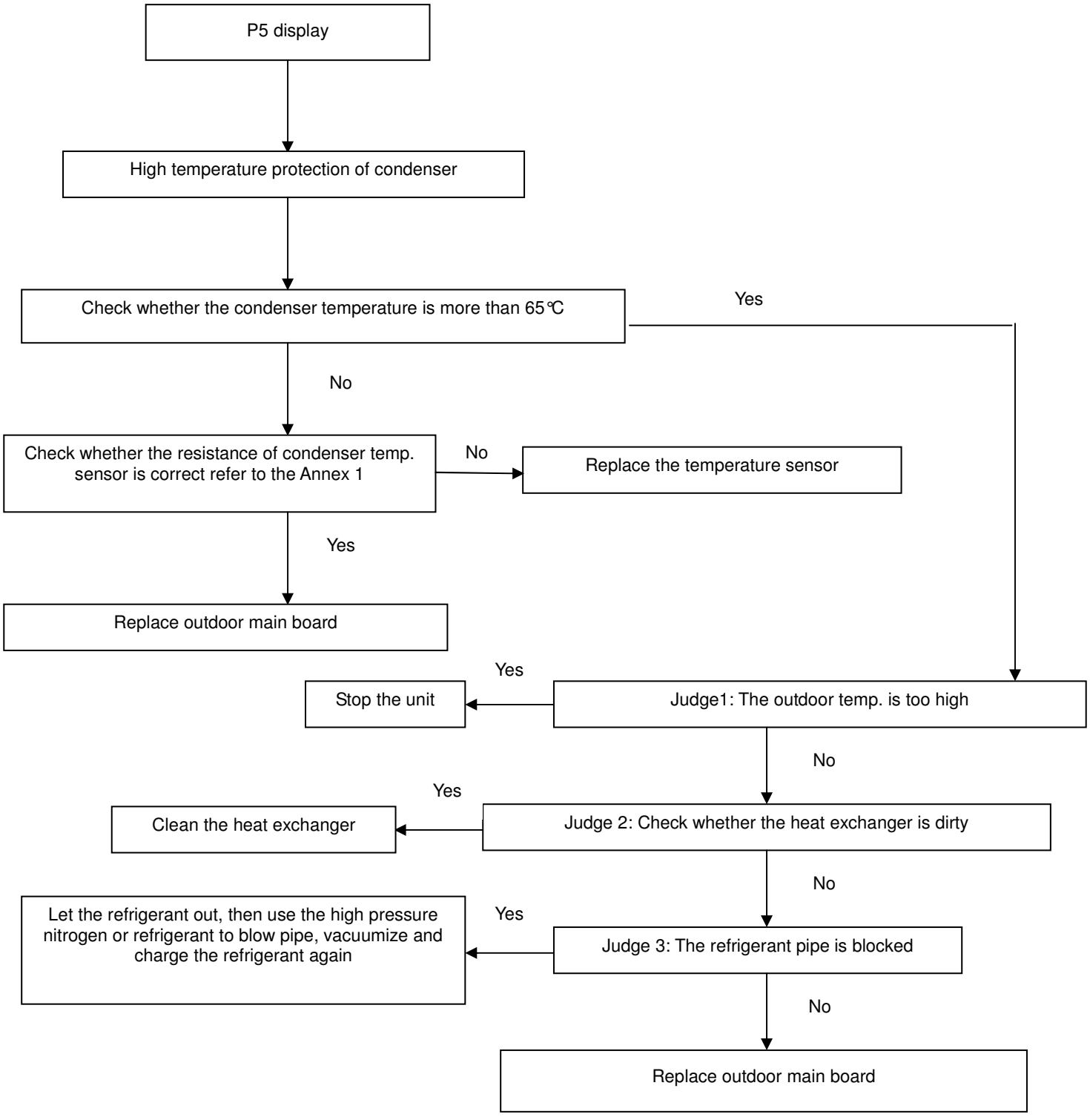
11. P4 malfunction

When compressor discharge temperature is higher than 115℃, the unit will stop, and unit runs again when compressor discharge temperature is lower than 90℃.

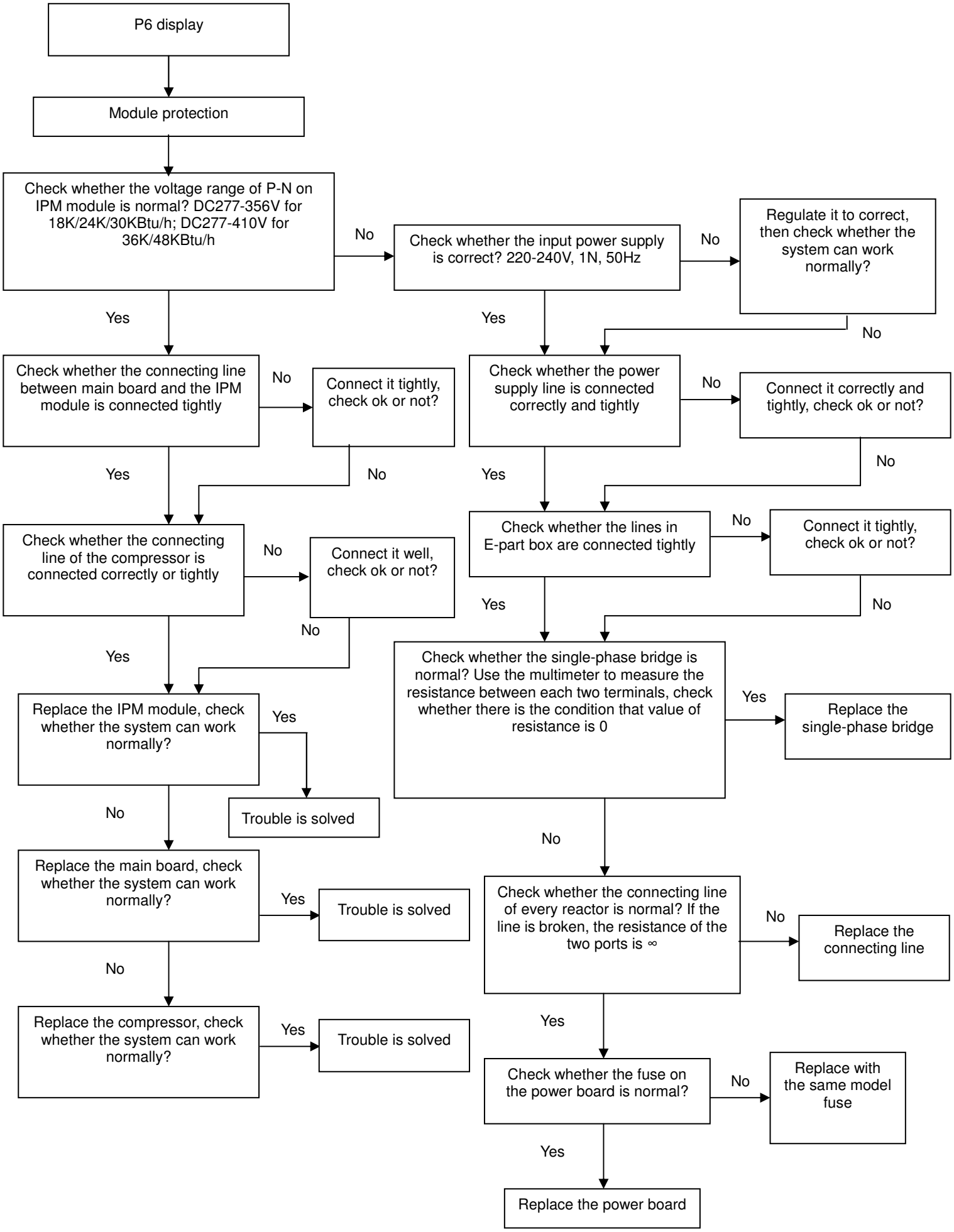

P4 display
Discharge temperature protection of compressor
Check whether the compressor discharge temp. is more than 115℃ ?
Yes
No
Check whether the wiring connection is right between compressor discharge temp. sensor and PCB according to wiring diagrams
No
Correct the wiring connection
Check whether the refrigerant is leak
Yes
Yes
Judge: The discharge temp. sensor is broken
Stop leaking and add refrigerant
Method: Check whether the resistance of compressor discharge temp. sensor is right refer to the Annex 2
No
Replace the compressor discharge temp. sensor
Yes
Replace outdoor main board

12. P5 malfunction

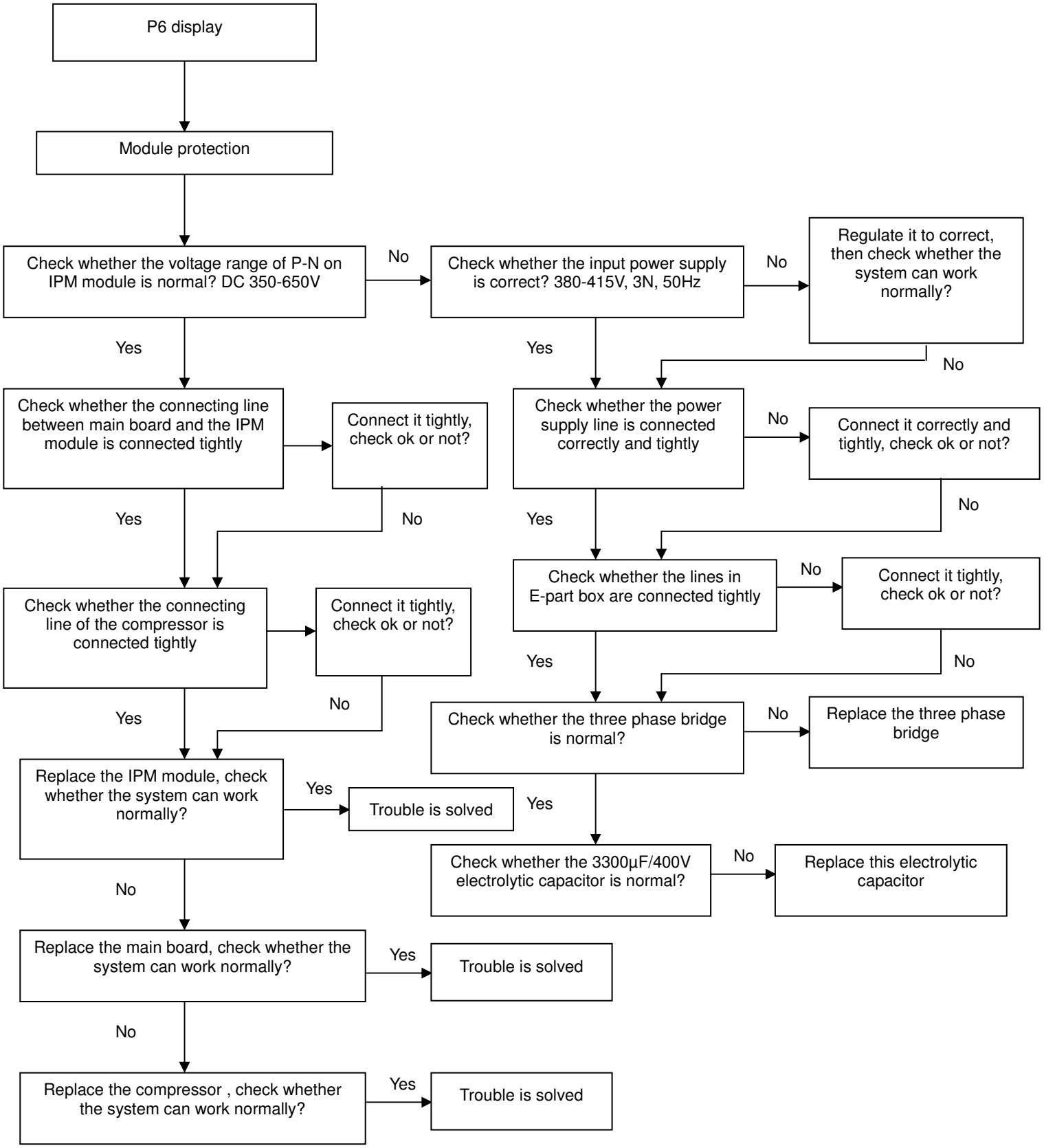
When condenser high temp. is more than 65℃, the unit will stop, and unit runs again when outdoor pipe temp. less than 52℃.


P5 display
High temperature protection of condenser
Check whether the condenser temperature is more than 65℃
Yes
No
Check whether the resistance of condenser temp. sensor is correct refer to the Annex 1
No
Replace the temperature sensor
Yes
Replace outdoor main board
Yes
Stop the unit
Judge1: The outdoor temp. is too high
No
Yes
Clean the heat exchanger
Judge 2: Check whether the heat exchanger is dirty
No
Let the refrigerant out, then use the high pressure nitrogen or refrigerant to blow pipe, vacuumize and charge the refrigerant again
Yes
Judge 3: The refrigerant pipe is blocked
No
Replace outdoor main board

13. P6 malfunction (For single phase units)


P6 display
Module protection
Check whether the voltage range of P-N on IPM module is normal? DC277-356V for 18K/24K/30KBtu/h; DC277-410V for 36K/48KBtu/h
No
Check whether the input power supply is correct? 220-240V, 1N, 50Hz
No
Regulate it to correct, then check whether the system can work normally?
Yes
Yes
No
Check whether the connecting line between main board and the IPM module is connected tightly
No
Connect it tightly, check ok or not?
Check whether the power supply line is connected correctly and tightly
No
Connect it correctly and tightly, check ok or not?
Yes
No
Yes
No
Check whether the connecting line of the compressor is connected correctly or tightly
No
Connect it well, check ok or not?
Check whether the lines in E-part box are connected tightly
No
Connect it tightly, check ok or not?
No
Yes
No
Yes
Check whether the single-phase bridge is normal? Use the multimeter to measure the resistance between each two terminals, check whether there is the condition that value of resistance is 0
Yes
Replace the single-phase bridge
Replace the IPM module, check whether the system can work normally?
Yes
Trouble is solved
No
No
Replace the main board, check whether the system can work normally?
Yes
Trouble is solved
Check whether the connecting line of every reactor is normal? If the line is broken, the resistance of the two ports is ∞
No
Replace the connecting line
No
Yes
Replace the compressor, check whether the system can work normally?
Yes
Trouble is solved
Check whether the fuse on the power board is normal?
No
Replace with the same model fuse
Yes
Replace the power board

14. P6 malfunction (For three phases units)


P6 display
Module protection
Check whether the voltage range of P-N on IPM module is normal? DC 350-650V
No
Check whether the input power supply is correct? 380-415V, 3N, 50Hz
No
Regulate it to correct, then check whether the system can work normally?
Yes
Yes
No
Check whether the connecting line between main board and the IPM module is connected tightly
Connect it tightly, check ok or not?
Check whether the power supply line is connected correctly and tightly
No
Connect it correctly and tightly, check ok or not?
Yes
No
Yes
No
Check whether the connecting line of the compressor is connected tightly
Connect it tightly, check ok or not?
Check whether the lines in E-part box are connected tightly
No
Connect it tightly, check ok or not?
Yes
No
No
Yes
Check whether the three phase bridge is normal?
No
Replace the three phase bridge
Replace the IPM module, check whether the system can work normally?
Yes
Trouble is solved
Yes
Check whether the 3300μF/400V electrolytic capacitor is normal?
No
Replace this electrolytic capacitor
No
Replace the main board, check whether the system can work normally?
Yes
Trouble is solved
No
Replace the compressor , check whether the system can work normally?
Yes
Trouble is solved

Part 5
Control

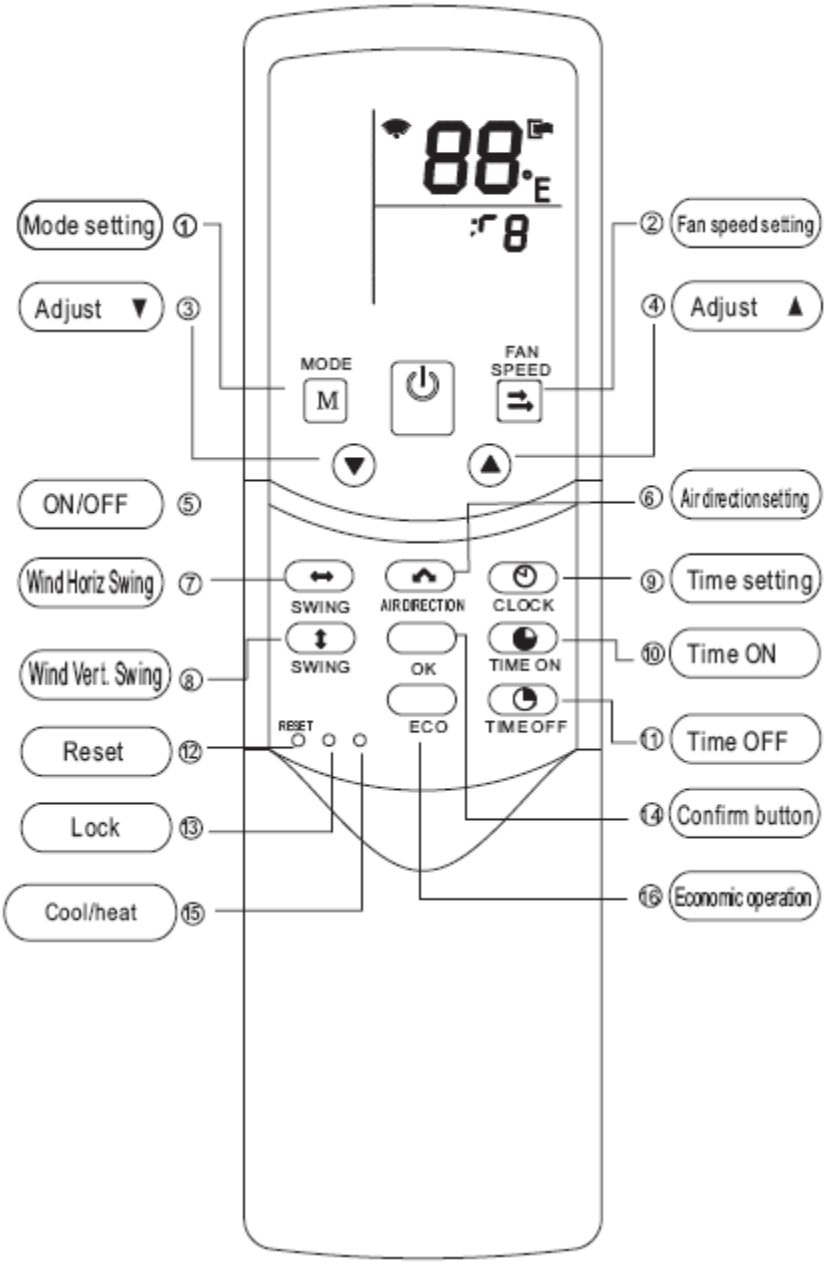
1. Standard Controller.....232
2. Optional Controller.....240

1. Standard controller

1.1 Wireless remote controller R05/BGE

This is for all the models of Four-way cassette type and Ceiling & floor type, and this is standard for them.

The below is R05-BG/E wireless remote controller



Visual photo

Note:

1. The outline figure on cover is for reference only, which may differ from what you purchased.
2. Make sure to read chapter PRECAUTIONS before you operate the air conditioner.
3. The content is available for model R05/BG.
4. R05/BGE can be applicable for cool only type and cool & heat type air conditioners.

Precautions

Curtain, door or the similar objects will prevent the remote signal from being received by air conditioner.

Do not get the interior of remote controller wet.

It is forbidden to expose it to direct sunlight or locate it in the place with high temp.

Malfunction may occur if infrared signal receiver on air conditioner is exposed to sunlight.

Please shelter the signal receiver from sunlight with curtain.

Please remove the nearby electronic device for they may affect the performance of remote controller.

Do not put the used or different batteries into the remote controller, otherwise remote controller will fail to send signal.

Please remove the batteries before long period unused, otherwise the remote controller may be damaged.

If pressing the button reset the remote controller, which indicates low battery, please replace the batteries.

If no receiving sound is heard from indoor unit or on remote controller does not flash, please replace the batteries.

Effective transmitting distance of remote controller is 8m, please aim the signal sending part to the receiver on air conditioner.

Model and specification

Model	R05/BGE
Rated voltage	3.0V(2pieces of LR03 7# batteries)
Min voltage for sending signal of CPU	2.4V
Effective receiving distance	8m~11m
Operation condition	-5~60

Buttons and their functions

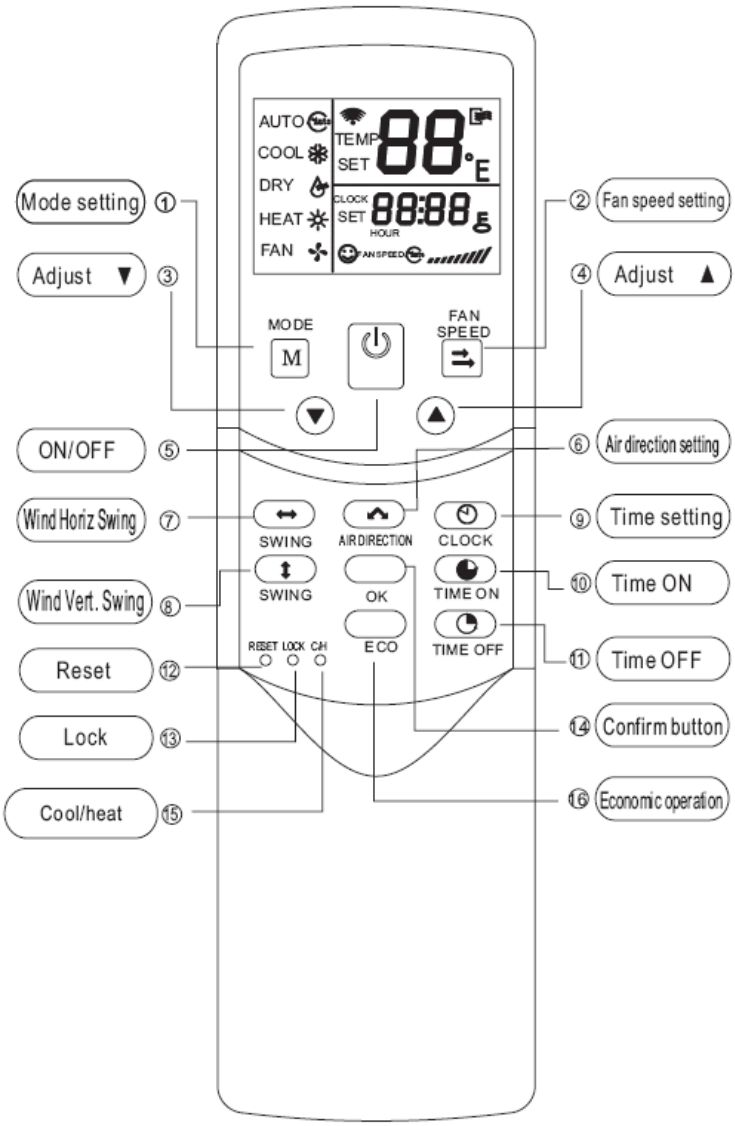
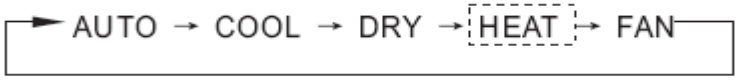


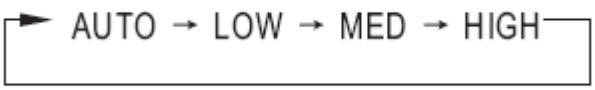
Chart 1

1. MODE: Once pressing, running mode will be selected in the following sequence:



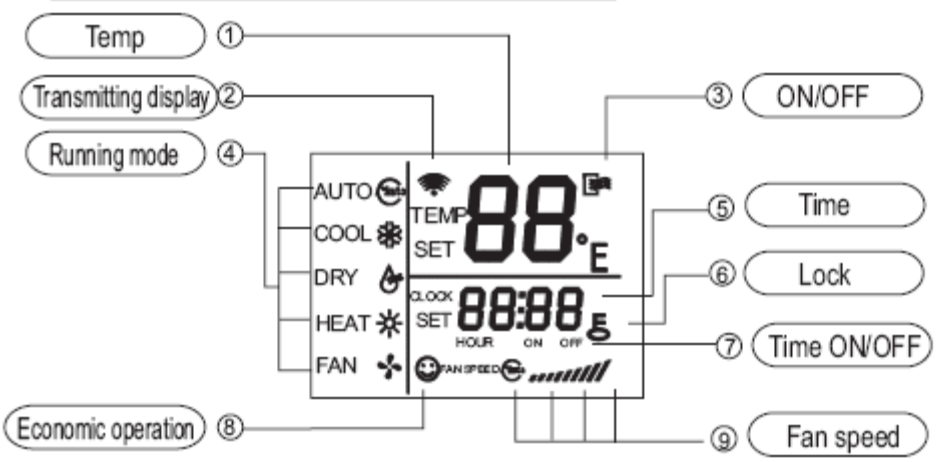
NOTE: No heating mode for cool only type unit.

2. FAN SPEED: Fan speed will be selected in following sequence once pressing this button:



3. Adjust: Decrease the set temp. Keeping pressing will decrease the temp with 1℃ per 0.5s.
4. Adjust: Increase the set temp. Keeping pressing will increase the temp with 1℃ per 0.5s.
5. ON/OFF: For turning on or turning off the air conditioner.
6. AIR DIRECTION: Activate swing function of air deflector. Once pressing, air deflector will turn 6℃. For normal operation and better cooling and heating effect, deflector will not turn to the degree which is the state of deflector when the unit is turned off.(Only available when remote controller is used with corresponding unit.)
7. Wind Horizontal Swing: Activate or turn off wind horizontal swing function. (Only available when remote controller is used with corresponding unit.)
8. Wind Vertical Swing: Activate or turn off wind vertical swing function. (Only available when remote controller is used with corresponding unit.)
9. CLOCK: Display the current time. (12:00 is displayed when resetting or electrifying for the first time.) Press CLOCK for 5s, icon indicating hour will flash with 0.5s. Press it again, icon indicating minute will flash with 0.5s. and are used to adjust the figure. Setting or modification is effective only by pressing OK button to make confirmation.
10. TIME ON: For time ON setting. Once pressing this button, the time will increase by 0.5 hour. When the set time exceeds 10 hours, pressing the button will increase the time by 1 hour. Adjusting the figure to 0.00 will cancel time ON setting.
11. TIME OFF: For time OFF setting. Once pressing this button, the time will increase by 0.5 hour. When the set time exceeds 10 hours, pressing the button will increase the time by 1 hour. Adjust the figure to 0.00 will cancel time ON setting.
12. RESET (inner located): Press this button with a needle of 1mm to cancel the current setting and reset remote controller.
13. LOCK (inner located): Press this button with a needle of 1mm to lock or unlock the current setting.
14. OK: Used to confirm the time setting and modification.
15. COOL/HEAT (inner located): Press this button with a needle of 1mm to shift mode between COOL only and COOL&HEAT. During setting, back light will be lightened. Factory default mode is COOL &HEAT.
16. ECO: Activate or turn off economic operation mode. It is suggested to turn on this function when sleeping. (Only available when remote controller is used with corresponding unit.)

Indicators and functions



1. Temp: Display the set temperature. Adjust temperature via and No display in this area if the unit is on FAN mode.

2. Transmitting display: The icon will flash once when the signal is sent by remote controller.
3. ON/FF: Icon is displayed when the remote controller is turned on, or vice versa.
4. Running mode: Press MODE to display current running mode. AUTO, COOL, DRY, HEAT and FAN can be selected. (HEAT function is invalid for cool only type unit.)
5. Time: Display the current set time. Press CLOCK for 5s, icon indicating hour will flash. Press this button again, icon indicating minute will flash. And are used to adjust the figure . Setting or modification is effective only by pressing OK button to make confirmation.
6. Lock: The icon will be lightened or off when pressing LOCK. In locked state, all the buttons are ineffective except button LOCK.
7. Time ON/OFF: In the state of time ON, icon ON will be lightened, which is the same to the state of time OFF. Setting timer ON and OFF simultaneously, both icons ON and OFF are displayed.
8. Fan speed: Press FAN SPEED to display the current wind speed. AUTO, LOW, MED and HIGH can be selected. The default state is high fan speed for the unit without medium fan speed.
9. Economic operation: This icon will be lightened or off when pressing ECO button.

NOTE: All the above icons will be displayed only when the remote controller is electrified for the first time or reset.

OPERATION INSTRUCTIONS

Install and replace batteries

Install 2 pieces of 7# alkaline batteries.

Slide the cover to install batteries and make sure to place them in right pole.

AUTO operation

Switch on the power and running indicator light on indoor unit flashes.

1. Press MODE to select AUTO.
2. Adjust temp via and. Generally the range is 17℃ ~30℃.
3. Press ON/OFF and running indicator light on indoor unit is lightened. Air conditioner will work on AUTO mode and fan speed is AUTO which is nonadjustable.
4. ECO is effective on AUTO operation.

COOL/HEAT/FAN operation

1. Press MODE to select COOL, HEAT or FAN.
2. Adjust temp via and. Generally the range is 17℃ ~30℃.
3. Press FAN SPEED to select AUTO, LOW, MED or HIGH.
4. Press ON/OFF and running indicator light on indoor unit is lightened. Air conditioner will work on the set mode. Stop operation via ON/OFF.

To adjust the figure. Setting or modification is effective only by pressing OK button to make confirmation.

NOTE: On FAN mode, temp is nonadjustable and ECO is ineffective. Procedure 2 is omitted.

DRY operation

1. Press MODE to select DRY.
2. Adjust temp via and. Generally the range is 17℃ ~30℃.
3. Press ON/OFF and running indicator light on indoor unit is lightened. Air conditioner will work on DRY mode. Turn off the unit via ON/OFF.
4. On DRY mode, ECO and FAN SPEED are unavailable.

Timer operation

TIME ON and TIME OFF are used to turn on and turn off the unit at the set time respectively.

TIME ON operation

1. Press TIME ON, icon SET, HOUR and ON are lightened.
2. Press TIME ON again and adjust the time.
3. Keep pressing this button, the time will increase by 0.5 hour. When the set time exceeds 10 hours, pressing the button will increase the time by 1 hour.
4. 0.5s after setting, remote controller will send TIME ON command to the unit.

TIME OFF operation

1. Press TIME OFF, icon SET, HOUR and OFF are lightened.
2. Press TIME OFF again and adjust the time.
3. Keep pressing this button, the time will increase by 0.5 hour. When the set time exceeds 10 hours, pressing the button will increase the time by 1 hour.
4. 0.5s after setting, remote controller will send TIME OFF command to the unit.

Set TIME ON and TIME OFF simultaneously

1. Set TIME ON according to procedures 1 and 2 specified in TIME ON operation.
2. Set TIME OFF as the procedures 1 and 2 specified in TIME OFF operation.
3. If both the set time of TIME ON and TIME OFF not exceed 10 hours, time OFF operation will activated 0.5 hour later than time ON operation. If both the set time of TIME ON and TIME OFF exceed 10 hours, time OFF operation will be activated 1 hour later than time ON operation.
4. 0.5s after setting, remote controller will send TIME ON command to the unit.

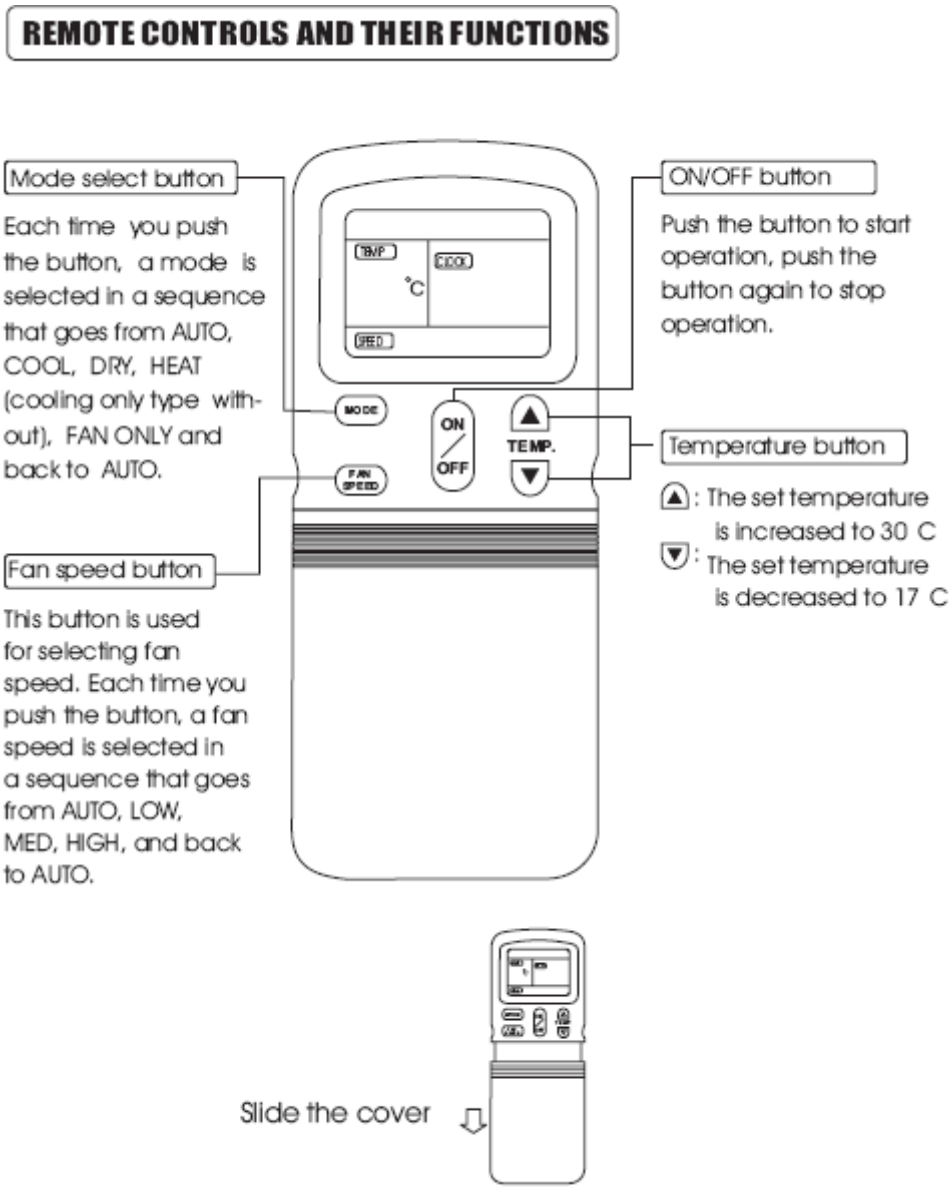
Modification of timer operation

Press corresponding button and readjust the time of time ON and time OFF. Adjust the time figure to 0.00 to cancel the timer operation.

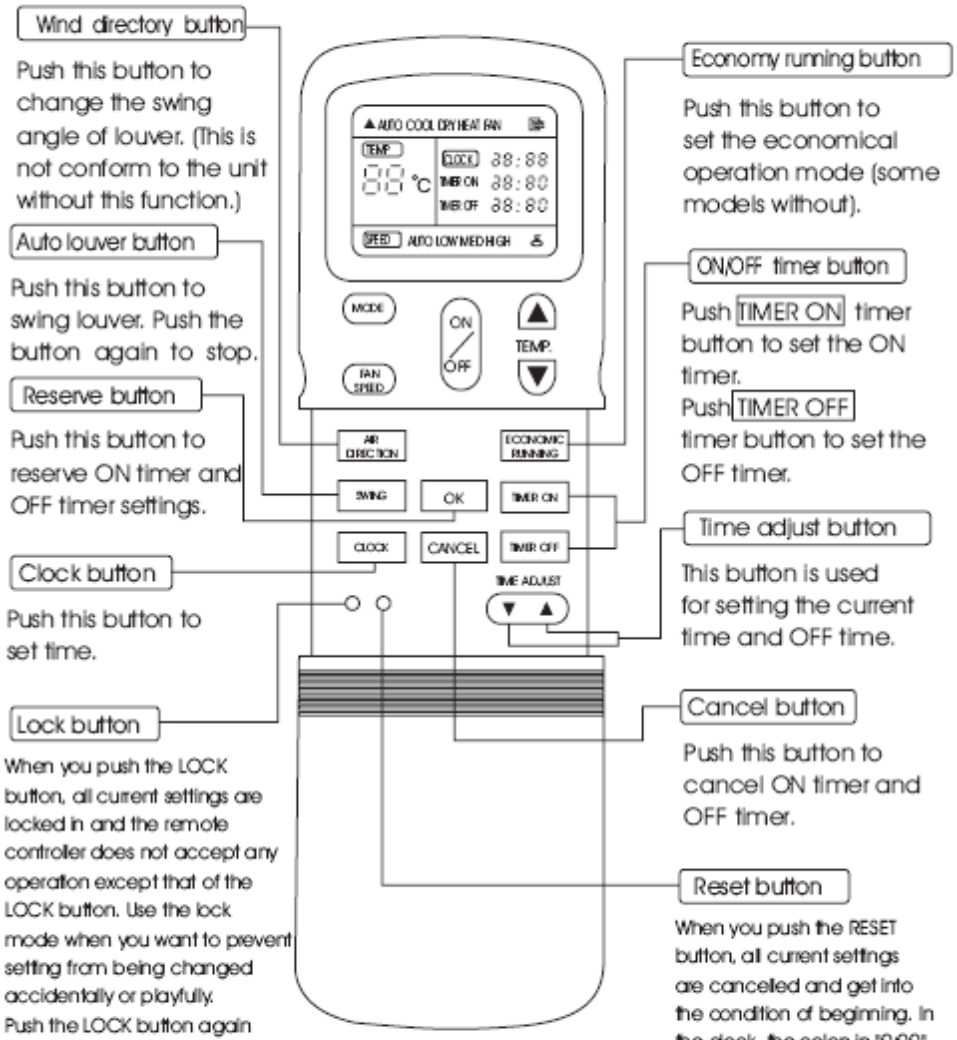
NOTE: The time set in timer operation is the relative figure based on the clock on remote controller. Adjusting clock is unavailable when TIME ON or TIME OFF is activated

1.2 Wireless remote controller R11HG/E

The model of R11HG/E is for CCT 301 INVi and CCT 501 INVi.

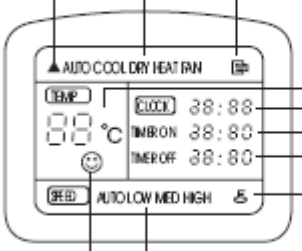

REMOTE CONTROLS AND THEIR FUNCTIONS
Mode select button
Each time you push the button, a mode is selected in a sequence that goes from AUTO, COOL, DRY, HEAT (cooling only type without), FAN ONLY and back to AUTO.
Fan speed button
This button is used for selecting fan speed. Each time you push the button, a fan speed is selected in a sequence that goes from AUTO, LOW, MED, HIGH, and back to AUTO.
ON/OFF button
Push the button to start operation, push the button again to stop operation.
Temperature button
: The set temperature is increased to 30 C
: The set temperature is decreased to 17 C
MODE
FAN SPEED
ON
OFF
TEMP.
Slide the cover

REMOTE CONTROLS AND THEIR FUNCTIONS


Wind directory button
Push this button to change the swing angle of louver. (This is not conform to the unit without this function.)
Auto louver button
Push this button to swing louver. Push the button again to stop.
Reserve button
Push this button to reserve ON timer and OFF timer settings.
Clock button
Push this button to set time.
Lock button
When you push the LOCK button, all current settings are locked in and the remote controller does not accept any operation except that of the LOCK button. Use the lock mode when you want to prevent setting from being changed accidentally or playfully. Push the LOCK button again when you want to cancel the LOCK mode.
Economy running button
Push this button to set the economical operation mode (some models without).
ON/OFF timer button
Push TIMER ON timer button to set the ON timer.
Push TIMER OFF timer button to set the OFF timer.
Time adjust button
This button is used for setting the current time and OFF time.
Cancel button
Push this button to cancel ON timer and OFF timer.
Reset button
When you push the RESET button, all current settings are cancelled and get into the condition of beginning. In the clock, the colon in "0:00" will flash, the mode displays "AUTO", fan speed displays "AUTO" the temperature displays "24".
AUTO COOL DRY HEAT FAN
TEMP.
CLOCK
TIMER ON
TIMER OFF
SPEED
AUTO LOW MED HIGH
MODE
ON
OFF
TEMP.
FAN SPEED
AIR DIRECTION
ECONOMIC RUNNING
SWING
OK
TIMER ON
CLOCK
CANCEL
TIMER OFF
TIME ADJUST

• The remote controller above drawing may have some differences from the one that you purchase.

NAMES AND FUNCTIONS OF INDICATORS ON REMOTE CONTROLLER



Transmission Indicator
This transmission indicator lights when remote controller transmits signals to the indoor unit.

Mode display
Displays the current operation mode. Including AUTO, COOL, DRY, HEAT(cooling only type without), FAN ONLY and back to AUTO.

ON/OFF display
Displayed by pushing the ON/OFF button.
Push the ON/OFF button again to disappear.

Temp. display
Displays the temperature setting (17 C to 30 C
When you set the operating mode to FAN ONLY, no temperature setting is displayed.

Clock display
The current time is indicated.(0 ~ 24 hours)

Timer display
The time set for timer operation is indicated.
(0 ~ 24 hours)

Lock display
Displayed by pushing the Lock button.
Push the Lock button again to disappear.

Fan speed display
Displays the selected fan speed, AUTO and three fan speed levels "LOW" "MED" "HIGH" can be indicated. Displays AUTO when the operating mode is either AUTO or DRY.

Econo. Display (Some models without)
Display by pushing the ECONO. button.
Push the ECONO. Button again to disappear.

- In the illustration, all displays are indicated for the sake of clarity. During operation, only the relevant displays will be shown on the remote controller.

Part 6
Control Function

1. Performance Index 263
2. Main Parts Introduction 264
3. Operation Modes and Functions 265
4. Other Functions 268
5. Main protective functions: 269
6. System precision 270
7. Point Check 271
8. Appendix 272

1. Performance Index

No.	Item	Index
1	Applicable Voltage Range	175-253V~,1ph, 342-418V~,3ph
2	A/C Frequency	50Hz
3	PCB Working environment temperature	-7℃~ +43℃

2. Main Parts Introduction

2.1 Indoor Fan

High speed, Medium speed and low speed.
Breeze speed for anti-cold air.

2.2 Outdoor Fan

High speed and low speed. For 36KBtu/h (single phase) & 48KBtu/h & 60KBtu/h unit there're two fans, separately controlled by relay.

2.3 Buzzer

2.3.1 It will buzz when its driving port in the main chip outputs high level.
2.3.2 it will buzz twice when the system is powered on.
2.3.2 It will buzz once when the main frame receives remote start-up signal, lasting 0.3sec
2.3.3 It will buzz once for 1 second when receiving turn-off signal.
2.3.4 It will buzz for 0.5 second once receiving other signal.

2.4 Indicator

2.4.1 There are 4 indicators: operating indicator, timer indicator, alarm indicator, defrosting indicator or pre-heating indicator.
2.4.2 LED indicates errors when protection is in effective.

2.5 Four-way Valve

It is controlled by relays. Normal working current is less than 1 amp.

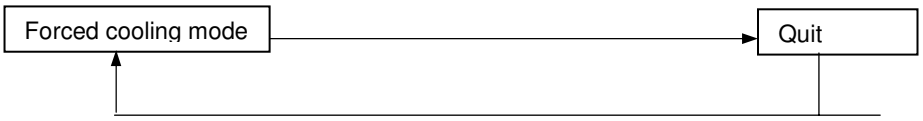
2.6 Crank Heater

It starts when T4<3℃ and the compressor shut down for more than 3 hours. Also it starts when T4<3℃ and reset the plug.
It will stop when T4>3℃ or compressor is on.

3. Operation Modes and Functions

3.1 Forced cooling

3.1.1 The forced cooling mode is controlled through “forced cooling” button on the outdoor PCB. The sequence is shown as below when “forced cooling” button is pressed each time



3.1.2 Forced Cooling mode

3.1.2.1 Under this mode, no remote control signal will be received.

3.1.2.2 The compressor is started up unconditionally and the rotating speed of indoor and outdoor fans is set to be in high and forced cooling operation.

3.1.2.3 Under this mode, the buzzer will buzz twice with each lasting 0.5 second at 0.5 interval. During the first 30 minutes of unconditional forced cooling operation, the operation indicator will blink at 0.5Hz. In the process of switchover to manual action mode, the buzzer buzzes for 0.5 second and the indicator is illuminated.

3.1.2.4 Under this mode, the corresponding protections are in effective (3- minute delayed start-up, over current, outdoor protection and evaporator low temperature protection.). Corresponding protection will act once any protection is in active.

Push “Forced cooling” button once to end this mode and enter the remote control pending status. The buzzer will buzz for 1 second and the indicator turn off.

3.1.3 Push “Forced cooling” button to end this mode and switch over to REMOTE CONTROL mode.

3.2 Heating Mode

3.2.1 Four-way valve opens at once, while defrosting process closes.

3.2.2 Indoor Fan Action

3.2.2.1 Anytime remote switchover for fan speeds among high/medium/low/auto, (anti-cold air function takes priority).

3.2.2.2 Anti-cold air:

Switchover between fan speed and fine tune can be set according to temperature of evaporator pipe .

	Condition T= Indoor exchanger temp.	Indoor fan speed
Indoor exchanger temp. up	T<28℃	Off
	28℃ <T<32℃	Breeze
	T>32℃	Setting fan speed
Indoor exchanger temp. down	T> 30℃	Setting fan speed
	15℃ <T<30℃	Breeze
	T<15℃	Off

During anti-cold air period, if indoor fan is shut down, then pre-heating/defrosting lamp is on. Once indoor fan starts, pre-heating/defrosting lamp will be off.

3.2.3.3 Auto fan of indoor fan under heating mode.

Condition: (T =Indoor Temp.-Setting Temp.)

If current mode is low speed, in case of T<2℃, it changes to medium speed

If current mode is medium speed, in case of T<1℃, it changes to high speed

If current mode is high speed, in case of >2℃, it changes to medium speed

If current mode is medium speed, in case of >3℃, it changes to low speed.

3.3 Defrosting Mode (only available for heating mode)

3.3.1.1 Defrosting Conditions

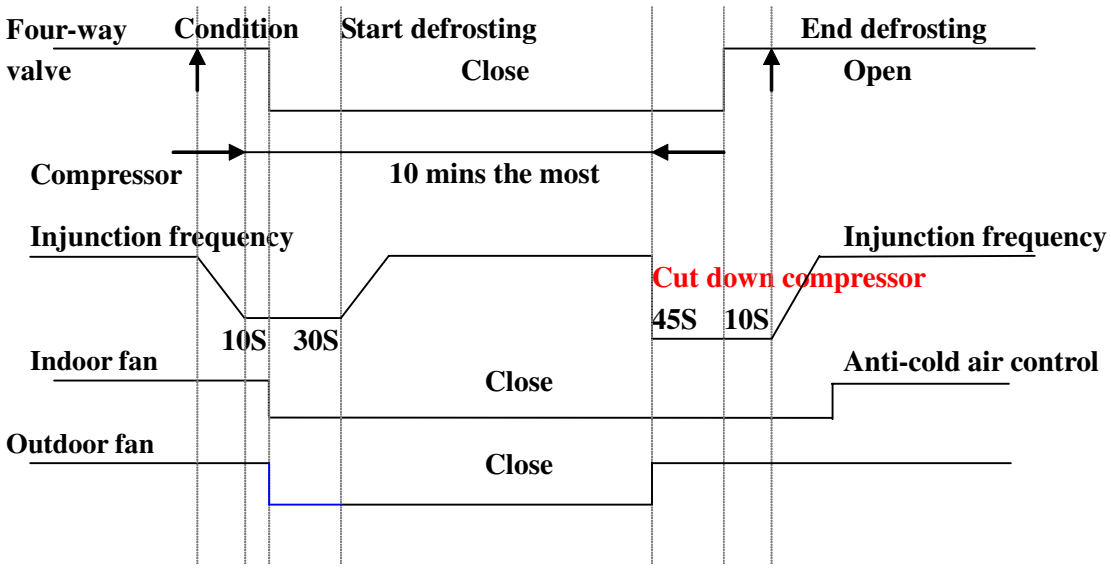
3.3.1.1.1 Low temperature defrosting condition:

Accumulated operating time when temperature of outdoor heat exchanger coil T3 is below -2℃ (For 36KBtu/h & 48KBtu/h with 1 phase, it’s 0℃) reaches up to over 40 minutes.

3.3.1.1.2 High temperature defrosting condition:
Under high temperature protection of evaporator, the time when outdoor fan is shut down but compressor is not has been accumulated for up to 90 minutes. It is considered that defrosting is performed when either 3.3.1.1 or 3.3.1.2 is met.

3.3.1.2 Defrosting Action
Four-way valve and outdoor fan are shut down. Indoor fan operates according to anti-cold air function. Compressor keeps on continuously. Defrosting lamp lights.

3.3.1.3 Ending of Defrosting Condition
It is considered that defrosting condition is ended when any of the conditions is met:
3.3.1.3.1 Time of defrosting reaches 10 minutes.
3.3.1.3.2 Temperature of outdoor coil T3 is up to 15℃.



3.3.1.4 Ending Action of Defrost
3.3.1.4.1 Outdoor fan and four-way valve are open.
3.3.1.4.2 Compressor keeps on continuously.
3.3.1.4.3 Indoor fan acts according to anti-cold air function.
3.3.1.4.4 Defrosting/pre-heating lamp remains on until indoor fan starts up.

3.4 Cooling Mode

3.4.1 Four-way valve is closed. If four-way valve is open before the machine enters cooling mode, then four-way valve will be closed at the first time the compressor starts under the cooling mode.

3.4.2 Action of Indoor Fan
3.4.2.1 HIGH/ MEDIUM /LOW/AUTO fan can be switched over for your comfort.
3.4.2.2 Auto fan under cooling mode.
Condition: (T =Indoor Temp.-Setting Temp.)
If current mode is high speed, in case of T≤3℃, it changes to medium speed
If current mode is medium speed, in case of T≤1℃, it changes to low speed
If current mode is low speed, in case of >3℃, it changes to medium speed
If current mode is medium speed, in case of >4℃, it changes to high speed.

3.5 Dehumidifying Mode

3.5.1 Dehumidifying mode is the cooling operation, under which the indoor fan is low speed.
3.5.2 Protective condition is priority.

3.6 Auto Mode

3.6.1 Under auto mode, the indoor fan is set to be auto (refer to auto fan under cooling, heating).under Auto mode the setting temperature is rang from 17~30 ℃.

3.6.2 When entering auto mode, the heating, fan only or cooling operation will be automatically chosen according to the room temperature Ta and the set temperature Ts.

3.6.2.1 When Ta < Ts - 1℃, it performs the heating operation with a set temperature of Ts - 1℃ (refer to the heating mode). And the fan runs according to the corresponding mode.

3.6.2.2 When Ts + 2℃ ≥ Ta ≥ Ts - 1℃, control according to cooling auto fan with a set temperature of 23℃.

3.6.2.3 When Ta > Ts +2℃, it performs the cooling operation with a set temperature of Ts (refer to the cooling mode).

3.6.3 After one mode is chosen, if the condition Ta > Ts+1℃ or Ta < Ts - 1℃ lasts for 15 minutes, meanwhile the compressor doesn't start up within consecutive 15 minutes, the operation mode will be re-chosen according to the Ta and Ts.

3.6.4 Protective condition is activated.

3.7. Fan Only Mode

3.7.1 Under this mode, four-way valve, compressor and outdoor fan are shut down.

3.7.2 High/Low/ Medium/Auto fan can be switched over through manual control. Auto fan will be controlled in line with cooling auto fan with temperature set to be 23℃.

3.7.3 After entering fan mode, the operating indicator is on. If the model is cooling only mode, fan indicator is on at the same time.

4. Other Functions

4.1 LED Display

Operation lamp, timer lamp, defrosting/pre-heating lamp, and water level alarm lamp.

4.1.1 Operation Lamp

When the operation is recovering, it will blink at 1 Hz.
After the unit is on, the lamp will keep on.
After the unit is off, the lamp will be off.
When the unit is switched over from manual cooling to remote control, the lamp will be off.

4.1.2 Timer Lamp

During timer operation, it will be on.

4.1.3 Defrosting/Pre-Heating Lamp

When heat pump model performs defrosting or anti-cold air, it will be on.

4.1.4 Water Level Alarm Lamp

When water level is above the alarm level, it will blink at 5Hz.

4.2 Timer

Refer to remote controller manual for detail operation.
Note: The timer is valid for one operation of the A/C.

4.3 Louver Action

For cassette and ceiling type, press the “swing” button (horizontal and vertical), the louver will change a certain degree.

4.4 Drain pump

Adopt the water-level switch to control the action of drain pump.
Main action under different condition :(every 5 seconds the system will check the water level one time)

1. When the A/C operates with cooling (including auto cooling), dehumidifying, and forced cooling mode, the pump will start running immediately and continuously, till stop cooling.
2. When standing-by, heating and fan only (including auto heating and auto fan), once the water level increase and up to the control point, LED will alarm and compressor will be forced stop running, at the same time the drain pump open and continue checking the water level. If the water level fall down and LED disalarmed (drain pump delay close 1 minute), the compressor restart (3 minutes delay protection prior) and operate with the last mode. Otherwise the entire system stop operating (including the pump) and LED remain alarming, this condition will not recover except power off.

5. Main protective functions:

5.1. 1 3-minute delay for the compressor start-up.

When first time powering on or after the stop of compressor, 3-minute delay will be needed to start the compressor.

When switch over between cooling/heating mode, the compressor stops automatically.

5.1.2 Evaporator protection against high temperature (heating mode)

Only available for heating mode, including auto heating mode.

※ Note: During protection, the indoor fan continues operating at a setting speed, while the anti-cold air function of heating and the compressor will be 3 minute delayed to shut down for protection.

5.1.3 Evaporator Protection against low temperature (cooling mode)

5.1.3.1 When the evaporator pipe temperature ≤ 2℃ and this lasts for 3 minutes, the compressor and outdoor fan will be shut off.

5.1.3.2 When the evaporator pipe temperature ≥ 7℃, it recovers.

5.1.3.3 The restart of the compressor shall execute the delay protection.

5.1.4 Anti-cold air protection

Only available in heating mode, including heating mode and heating operation under auto mode.

When the indoor temp. raises, if it is lower than 28℃, the indoor fan stops; if it is between 28-32℃, the indoor fan will run with low speed; and if it is higher than 32℃, the indoor fan will run with the setting speed. When the indoor temp. drops, if it is lower than 15℃, the indoor fan stops; if it is between 15-30℃, the indoor fan will run with low speed; and if it is higher than 30℃, the indoor fan will run with the setting speed.

5.1.5 Condenser high temperature protection

5.1.6.1 Only available to cooling (incl. cooling mode, cooling operation under auto mode) and dehumidifying mode.

5.1.6.2 Delay protection should be performed when the compressor restarts.

5.1.6 Outdoor protection

When outdoor protection happen, system will stop running and LED display corresponding contents.

5.1.7 Power supply electricity sequence protection

1. For 1 phase unit it owns a starting circuit. 1 second before startup, capacitor is switched on and then broken.
2. For 3 phase unit it must have the phase sequence and lacking of phase checking and protecting function. Etc.

6. System precision

1) Temperature sampling precision: ±1℃
2) Current sampling precision: ±1.5 amps
3) Timing sampling precision: ±1min/hour
4) Swing angle sampling precision: 0.7 degree

7. Point Check

There's a point-check button in the outdoor PCB，it cooperates with LED in the outdoor PCB to show the status of the outdoor unit. Each time the button is pressed, the data shown in the LED is different. The details are shown in the following:

0, Normal display
1, Running mode: 0---Stand by;2---Cooling;3---Heating;4---Forced cooling;
2, Running fan speed: 0---Turn off; 1---Low speed; 2---High speed;
3, Capacity demand
4, T3- Outdoor pipe temp. (Actual value)
5, TP-Discharge temp.(Actual value, if it is over 100,only display hundreds digit and tens digit)
6, T4-Ambient temp.(Actual value)
7, Current of compressor
8, Outdoor PMV opening degree
9, The last error or protection code (Display 00 if no error)
10, AD value of volt
11.--

8. Appendix

Appendix 1

Temp	Resistance（KΩ）			Resist.tol %		Temp.tol℃	
（Φ）	Rmax	R（t）Normal	Rmin	MAX(+)	MIN(-)	MAX(+)	MIN(-)
-20	116.539	106.732	96.920	9.19	9.19	1.59	1.59
-19	110.231	100.552	91.451	9.63	9.05	1.57	1.57
-18	103.743	94.769	86.328	9.47	8.91	1.56	1.55
-17	97.673	89.353	81.525	9.31	8.76	1.54	1.54
-16	91.990	84.278	77.017	9.15	8.62	1.53	1.52
-15	86.669	79.521	72.788	8.99	8.47	1.51	1.50
-14	81.684	75.059	68.815	8.83	8.32	1.49	1.48
-13	77.013	70.873	65.083	8.66	8.17	1.47	1.47
-12	72.632	66.943	61.574	8.50	8.02	1.45	1.45
-11	68.523	63.252	58.274	8.33	7.87	1.44	1.43
-10	64.668	59.784	55.169	8.17	7.72	1.42	1.41
-9	61.048	56.524	52.246	8.00	7.57	1.40	1.39
-8	57.649	53.458	49.492	7.84	7.42	1.38	1.37
-7	54.456	50.575	46.899	7.67	7.27	1.35	1.35
-6	51.456	47.862	44.455	7.51	7.12	1.33	1.32
-5	48.636	45.308	42.150	7.35	6.97	1.31	1.30
-4	45.984	42.903	39.977	7.18	6.82	1.29	1.28
-3	43.490	40.638	37.927	7.02	6.67	1.27	1.26
-2	41.144	38.504	35.992	6.86	6.52	1.25	1.24
-1	38.935	36.492	34.165	6.70	6.38	1.23	1.21
0	36.857	34.596	32.440	6.53	6.23	1.21	1.19
1	34.898	32.807	30.810	6.38	6.09	1.18	1.17
2	33.055	31.120	29.271	6.22	5.94	1.16	1.15
3	31.317	29.528	27.815	6.06	5.80	1.14	1.12
4	29.681	28.026	26.440	5.90	5.66	1.12	1.10
5	28.138	26.608	25.140	5.75	5.52	1.10	1.08
6	26.682	25.268	23.909	5.60	5.38	1.07	1.06
7	25.310	24.003	22.745	5.45	5.24	1.05	1.03
8	24.016	22.808	21.644	5.30	5.10	1.03	1.01
9	22.794	21.678	20.601	5.15	4.97	1.01	0.99
10	21.641	20.610	19.614	5.00	4.83	0.99	0.97
11	20.553	19.601	18.680	4.86	4.70	0.96	0.94
12	19.525	18.646	17.794	4.71	4.57	0.94	0.92
13	18.554	17.743	16.955	4.57	4.44	0.92	0.90
14	17.636	16.888	16.160	4.43	4.31	0.90	0.88
15	16.769	16.079	15.406	4.29	4.19	0.88	0.85
16	15.949	15.313	14.691	4.15	4.06	0.86	0.83
17	15.174	14.588	14.014	4.02	3.94	0.84	0.81
18	14.442	13.902	13.372	3.89	3.81	0.81	0.79
19	13.748	13.251	12.762	3.75	3.69	0.79	0.76
20	13.093	12.635	12.183	3.62	3.57	0.77	0.74
21	12.471	12.050	11.634	3.50	3.46	0.75	0.72
22	11.883	11.496	11.112	3.37	3.34	0.73	0.70
23	11.327	10.971	10.617	3.25	3.23	0.71	0.68
24	10.800	10.473	10.147	3.12	3.11	0.69	0.66
25	10.300	10.000	9.700	3.00	3.00	0.67	0.63

Temp	Resistance（KΩ）			Resist.tol %		Temp.tol℃	
（Φ）	Rmax	R（t）Normal	Rmin	MAX(+)	MIN(-)	MAX(+)	MIN(-)
26	9.848	9.551	9.255	3.11	3.10	0.69	0.66
27	9.418	9.125	8.834	3.21	3.19	0.72	0.69
28	9.010	8.721	8.434	3.31	3.29	0.75	0.71
29	8.621	8.337	8.055	3.41	3.38	0.77	0.74
30	8.252	7.972	7.695	3.51	3.47	0.80	0.77
31	7.900	7.625	7.353	3.61	3.57	0.83	0.79
32	7.566	7.296	7.029	3.70	3.66	0.85	0.82
33	7.247	6.982	6.721	3.80	3.74	0.88	0.84
34	6.944	6.684	6.428	3.89	3.83	0.91	0.87
35	6.656	6.401	6.150	3.98	3.92	0.93	0.90
36	6.381	6.131	5.886	4.08	4.00	0.96	0.93
37	6.119	5.874	5.634	4.17	4.09	0.98	0.95
38	5.870	5.630	5.395	4.26	4.17	1.01	0.98
39	5.631	5.397	5.167	4.34	4.26	1.03	1.01
40	5.404	5.175	4.951	4.43	4.34	1.06	1.03
41	5.188	4.964	4.745	4.52	4.42	1.09	1.06
42	4.982	4.763	4.549	4.60	4.50	1.12	1.09
43	4.785	4.571	4.362	4.69	4.58	1.14	1.12
44	4.596	4.387	4.183	4.77	4.66	1.17	1.14
45	4.417	4.213	4.014	4.85	4.74	1.19	1.17
46	4.246	4.046	3.851	4.93	4.81	1.22	1.20
47	4.082	3.887	3.697	5.02	4.89	1.25	1.23
48	3.925	3.735	3.550	5.10	4.97	1.28	1.25
49	3.776	3.590	3.409	5.18	5.04	1.30	1.28
50	3.632	3.451	3.274	5.25	5.12	1.33	1.30
51	3.495	3.318	3.146	5.33	5.19	1.35	1.33
52	3.363	3.191	3.023	5.41	5.26	1.41	1.36
53	3.237	3.069	2.905	5.49	5.34	1.43	1.38
54	3.116	2.952	2.793	5.56	5.41	1.46	1.41
55	3.001	2.841	2.685	5.64	5.48	1.48	1.44
56	2.890	2.734	2.582	5.71	5.55	1.51	1.46
57	2.784	2.632	2.484	5.79	5.62	1.54	1.49
58	2.682	2.534	2.390	5.86	5.69	1.56	1.52
59	2.585	2.440	2.299	5.93	5.76	1.59	1.54
60	2.491	2.350	2.213	6.01	5.83	1.62	1.57
61	2.401	2.264	2.130	6.08	5.90	1.64	1.60
62	2.315	2.181	2.051	6.15	5.96	1.67	1.62
63	2.233	2.102	1.975	6.22	6.03	1.70	1.65
64	2.154	2.026	1.903	6.29	6.10	1.72	1.68
65	2.077	1.953	1.833	6.36	6.16	1.75	1.70
66	2.004	1.883	1.766	6.42	6.23	1.77	1.73
67	1.934	1.816	1.702	6.49	6.29	1.80	1.76
68	1.867	1.752	1.641	6.56	6.35	1.83	1.78
69	1.802	1.690	1.582	6.62	6.41	1.85	1.81
70	1.740	1.631	1.525	6.69	6.48	1.88	1.84
71	1.680	1.574	1.471	6.75	6.54	1.91	1.86
72	1.622	1.519	1.419	6.82	6.60	1.93	1.89
73	1.567	1.466	1.369	6.88	6.66	1.96	1.92

Temp	Resistance（KΩ）			Resist.tol %		Temp.tol℃	
（Φ）	Rmax	R（t）Normal	Rmin	MAX(+)	MIN(-)	MAX(+)	MIN(-)
74	1.514	1.416	1.321	6.94	6.71	1.98	1.94
75	1.463	1.367	1.275	7.00	6.77	2.01	1.97
76	1.414	1.321	1.230	7.06	6.83	2.04	2.00
77	1.367	1.276	1.188	7.12	6.88	2.06	2.02
78	1.321	1.233	1.147	7.17	6.94	2.09	2.05
79	1.277	1.191	1.108	7.23	6.99	2.12	2.08
80	1.235	1.151	1.070	7.28	7.04	2.14	2.11
81	1.195	1.113	1.034	7.33	7.09	2.17	2.13
82	1.156	1.076	0.999	7.39	7.14	2.20	2.16
83	1.118	1.041	0.966	7.44	7.18	2.22	2.19
84	1.082	1.007	0.934	7.48	7.23	2.25	2.21
85	1.047	0.974	0.903	7.53	7.27	2.27	2.24
86	1.014	0.942	0.874	7.57	7.31	2.30	2.27
87	0.982	0.912	0.845	7.62	7.35	2.33	2.29
88	0.951	0.883	0.818	7.66	7.39	2.35	2.32
89	0.921	0.855	0.791	7.69	7.43	2.38	2.35
90	0.892	0.828	0.766	7.73	7.46	2.41	2.37
91	0.864	0.802	0.742	7.76	7.49	2.43	2.40
92	0.838	0.777	0.719	7.80	7.52	2.46	2.43
93	0.812	0.753	0.696	7.82	7.54	2.48	2.45
94	0.787	0.730	0.675	7.85	7.57	2.51	2.48
95	0.763	0.708	0.654	7.87	7.59	2.54	2.51
96	0.740	0.686	0.634	7.89	7.61	2.56	2.53
97	0.718	0.666	0.615	7.91	7.62	2.59	2.56
98	0.697	0.646	0.597	7.93	7.63	2.62	2.59
99	0.677	0.627	0.579	7.94	7.64	2.64	2.61
100	0.657	0.609	0.562	7.94	7.65	2.67	2.64
101	0.638	0.591	0.546	7.95	7.65	2.70	2.67
102	0.620	0.574	0.530	7.95	7.65	2.72	2.69
103	0.602	0.558	0.515	7.94	7.64	2.75	2.72
104	0.585	0.542	0.501	7.94	7.63	2.77	2.75
105	0.569	0.527	0.485	7.92	7.92	2.80	2.77

Appendix 2

Unit: Φ---K			Discharge temp. sensor table				
-20	542.7	20	68.66	60	13.59	100	3.702
-19	511.9	21	65.62	61	13.11	101	3.595
-18	483	22	62.73	62	12.65	102	3.492
-17	455.9	23	59.98	63	12.21	103	3.392
-16	430.5	24	57.37	64	11.79	104	3.296
-15	406.7	25	54.89	65	11.38	105	3.203
-14	384.3	26	52.53	66	10.99	106	3.113
-13	363.3	27	50.28	67	10.61	107	3.025
-12	343.6	28	48.14	68	10.25	108	2.941
-11	325.1	29	46.11	69	9.902	109	2.86
-10	307.7	30	44.17	70	9.569	110	2.781
-9	291.3	31	42.33	71	9.248	111	2.704
-8	275.9	32	40.57	72	8.94	112	2.63
-7	261.4	33	38.89	73	8.643	113	2.559
-6	247.8	34	37.3	74	8.358	114	2.489
-5	234.9	35	35.78	75	8.084	115	2.422
-4	222.8	36	34.32	76	7.82	116	2.357
-3	211.4	37	32.94	77	7.566	117	2.294
-2	200.7	38	31.62	78	7.321	118	2.233
-1	190.5	39	30.36	79	7.086	119	2.174
0	180.9	40	29.15	80	6.859	120	2.117
1	171.9	41	28	81	6.641	121	2.061
2	163.3	42	26.9	82	6.43	122	2.007
3	155.2	43	25.86	83	6.228	123	1.955
4	147.6	44	24.85	84	6.033	124	1.905
5	140.4	45	23.89	85	5.844	125	1.856
6	133.5	46	22.89	86	5.663	126	1.808
7	127.1	47	22.1	87	5.488	127	1.762
8	121	48	21.26	88	5.32	128	1.717
9	115.2	49	20.46	89	5.157	129	1.674
10	109.8	50	19.69	90	5	130	1.632
11	104.6	51	18.96	91	4.849		
12	99.69	52	18.26	92	4.703		
13	95.05	53	17.58	93	4.562		
14	90.66	54	16.94	94	4.426		
15	86.49	55	16.32	95	4.294	B(25/50)=3950K	
16	82.54	56	15.73	96	4.167		
17	78.79	57	15.16	97	4.045	R(90℃)=5KΩ±3%	
18	75.24	58	14.62	98	3.927		
19	71.86	59	14.09	99	3.812		